



AMERICAN ACADEMY OF ARTS & SCIENCES

WWW.AMACAD.ORG

# Bulletin

SPRING 2014  
VOL. LXVII, NO. 3

## Public Higher Education & the Private Sector

*Robert J. Birgeneau, Mary Sue Coleman, Philip Bredesen, Don M. Randel, and Frank D. Yeary*



## The Humanities in the Digital Age

*Richard Saller, Elaine Treharne, Franco Moretti, Joshua Cohen, and Michael A. Keller*



ALSO: Commission's *Heart of the Matter* Report Has Broad Impact  
*Dædalus* Examines "Growing Pains in a Rising China"  
Around the Country  
SILA—The Competing Interests Shaping the Future of our Planet

# Upcoming Events

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## APRIL

**17th**

House of the Academy, Cambridge

*Growing Pains in a Rising China*

Featuring:

**Elizabeth Perry** (Harvard University)

**Ching Kwan Lee** (University of California, Los Angeles)

**Benjamin L. Liebman** (Columbia Law School)

**Barry Naughton** (University of California, San Diego)

**29th**

Carnegie Institution for Science,  
Washington, D.C.

in partnership with The Royal Society of  
London and the Carnegie Institution for  
Science

*The Universe is Stranger Than We Thought*

Featuring:

**Wendy Freedman** (Carnegie Institution for  
Science)

**Martin Rees** (University of Cambridge;  
The Royal Society)

**Richard A. Meserve** (Carnegie Institution  
for Science)

## MAY

**15th**

House of the Academy, Cambridge

*Al-Qaeda and the Bomb: How Institutions Pro-  
tect against the Threat of Nuclear Terrorism*

Featuring:

**Scott D. Sagan** (Stanford University)

**Paul N. Stockton** (formerly, U.S. Depart-  
ment of Defense)

**Matthew Bunn** (Harvard Kennedy School)

**Thomas Hegghammer** (The Norwegian  
Defence Research Establishment, Oslo)

**19th**

New York City

*Reception for New York Area Fellows*

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*For updates and additions to the calendar, visit [www.amacad.org](http://www.amacad.org).*

## Projects and Activities

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- 2 *The Heart of the Matter* Report Has Broad Impact
- 4 Around the Country
- 6 *Dædalus* Examines “Growing Pains in a Rising China”

## Presentations

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- 7 Public Higher Education & the Private Sector
- 18 SILA – The Competing Interests Shaping the Future of our Planet
- 25 The Humanities in the Digital Age

## Update on Members

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- 36 Noteworthy
- 39 Remembrance



Clockwise from top left: Commission on the Humanities and Social Sciences: *The Heart of the Matter*, Alan Alda, Mary Sue Coleman, Robert J. Birgeneau, Don M. Randel, Frank D. Yeary, Chantal Bilodeau, and Joshua Cohen

## Commission's *Heart of the Matter* Report Has Broad Impact



Released in June of 2013, *The Heart of the Matter*, the report of the American Academy's Commission on the Humanities and Social Sciences, has become an integral part of an ongoing national dialogue about the state of the humanities and social sciences in the United States.

The report lays out three main goals and thirteen recommendations for advancing the humanities and social sciences in America, focusing on creating an engaged and literate public; funding research and support for educators; and promoting language learning, area studies, and study-abroad programs to strengthen U.S. leadership in an increasingly interconnected world.

Since June, nearly 100,000 copies of the report have been distributed, and the executive summary has been translated into Spanish and Korean. A companion film – produced by the Ewers Brothers and featuring Ken Burns, Yo-Yo Ma, John Lithgow, and other members of the Commission – has received over 30,000 views. The film has been screened at faculty meetings and university outreach events, and at board meetings of state humanities councils and nonprofit foundations. In addition, the report has been featured in nearly 300 newspapers, podcasts, and television programs, including *The New York Times*, *Psychology Today*, *The Guardian*, *National Public Radio*, *PBS*, and *The Colbert Report*, opening doors for new collaborations.

Institutions of higher education have adopted parts of *The Heart of the Matter* for dozens of purposes – for local fundraising, curricular reform, and even community-building. Several colleges have made the report required reading for incoming students, and two universities – the University of South Carolina and Carnegie Mellon University – showed the companion film to incoming freshmen. Commission members Annette Gordon-Reed (Harvard University) and John Lithgow (Los Angeles, California) were invited speakers at the University of Maryland's Worldwise Arts & Humanities Dean's Lecture Series. Commission Cochair Richard Brodhead (Duke University), Congressman David Price, Commission member Karl Eikenberry (Stanford University), UNC President Thomas Ross, and NC State University Chancellor Randy Woodson discussed the report during a symposium at NC State University in March. Later in the spring, Commission members Norman Augustine (Lockheed Martin Corporation) and Hunter Rawlings (Association of American Universities) will



Commission member **Karl W. Eikenberry**, UNC President **Thomas W. Ross**, NC State University College of Humanities and Social Sciences Dean **Jeffery P. Braden**, Commission Cochair **Richard H. Brodhead**, and U.S. Representative **David E. Price**



**WBEZ reporter Alison Cuddy; Commission members John W. Rowe, Richard H. Brodhead, and Diane P. Wood; Chair of the Academy Board Don M. Randel; MLA President Marianne Hirsch; and Commission member Karl W. Eikenberry**

speak at Carnegie Mellon University as part of CMU President Subra Suresh's inaugural presidential lecture series.

Events in conversation with the report continue to take place all across the United States, including a series of forums cosponsored by the Federation of State Humanities Councils, the National Humanities Alliance, and the Institute of Museum and Library Services. Forums have been held with Commission members David Souter (Supreme Court of the United States) at the state library in Albany, New York, and Wayne Clough (Smithsonian Institution) at the University of West Georgia in Carrollton, Georgia, and events are planned for later this year in Kansas, Oklahoma, and Maine. Through these gatherings and dozens of other events around the country, scholars, leaders of academic and nonprofit institutions, and other members of the public are exchanging ideas for the practical implementation of the Commission's goals in local communities.

In partnership with the Chicago Humanities Festival and the Modern Language Association, the American Academy hosted the Chicago Humanities Summit on January 9, 2014, bringing humanists and social scientists from all over the United States to partici-

pate in a series of hands-on workshops on the public humanities. Commission Cochairs Richard Brodhead and John Rowe (Exelon Corporation) and Commission member Diane Wood (United States Court of Appeals, Seventh Circuit) opened the Summit. On the evening before the Summit, Karl Eikenberry, former U.S. Ambassador to Afghanistan and retired Lieutenant General of the U.S. Army, spoke to a group of Summit organizers and local Academy Fellows about the importance of language education and international studies for U.S. diplomatic interests and on-the-ground relationships with the citizens of other countries.

The Commission was convened in response to a request from a bipartisan group of legislators: Lamar Alexander (R-Tennessee), Mark Warner (D-Virginia), Tom Petri (R-Wisconsin), and David Price (D-North Carolina). Commission members continue to seek new ways to amplify their message and new forums to share their report. To join the conversation and to learn more about the Commission and its upcoming events and media coverage, please visit [www.humanitiescommission.org](http://www.humanitiescommission.org). ■

## Around the Country

Chicago

On February 15, 2014, at a reception for Fellows held in Chicago in conjunction with the Annual Meeting of the American Association for the Advancement of Science, Alan Alda spoke about the honor of being elected to the Academy and the opportunity Fellows have to help the Academy address critical challenges facing our global society. The following is an edited version of his remarks.



### Alan Alda

*Alan Alda is an actor, writer, and director. He was elected a Fellow of the American Academy in 2006.*

*The Academy is a wonderful organization. It has great promise, but the promise will only be fulfilled if we commit ourselves a little. It is an honor to be asked to join the Academy. It is a shame not to do something to further the mission of this great institution.*

As Fellows of the American Academy, we probably all had the same reaction when we received the letter notifying us of our election: “Oh, my God. John Adams wants me to be in a club with him! And Ben Franklin and Thomas Jefferson too.” What an amazing group of people they were. They founded a *country*—and they propelled that country more than two hundred years into the future. I sometimes think about the high percentage of smart and engaged people who lived back then. There were between 2 and 3 million people in the colonies. Today, we have more than a hundred times that many. Shouldn’t we have a hundred times as many people like Thomas Jefferson and John Adams—people engaged and smart enough to propel us into the next two hundred years? And not long ago, as I was thinking about that, it hit me: There *are* people in this country capable of that vision. Many of them are here in this room, along with Academy Fellows who are not here tonight—people who, if

they engage together, can work on some of the problems that *now* try our souls. And we certainly have plenty of problems. All it takes is a measure of commitment. So, if you are asked to participate in a project of the Academy—if you are asked to write a piece for *Dædalus*, or to take part in a project in which your expertise would count, or even just to nominate for membership somebody whose thinking would be valuable to have among everybody else’s—I hope you will give it serious thought. If the Academy’s founders could pledge their lives, their fortunes, and their sacred honor, we can certainly pledge a little of our time and thought. The Academy is a wonderful organization. It has great promise, but the promise will only be fulfilled if we commit ourselves a little. It is an honor to be asked to join the Academy. It is a shame not to do something to further the mission of this great institution. ■

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Clockwise from top left:

**Lewis Branscomb** (Harvard University) and **R. Stephen Berry** (University of Chicago)

**Alan Alda** (New York, New York), **Diane P. Wood** (United States Court of Appeals, Seventh Circuit), and **Siegfried Hecker** (Stanford University)

**David E. Shaw** (Black Point Group) and **Elizabeth Loftus** (University of California, Irvine)

**Robert Kirshner** (Harvard University), **Philip Phillips** (University of Illinois at Urbana-Champaign), and **Laura Greene** (University of Illinois at Urbana-Champaign)

**Martin Chalfie** (Columbia University) and **John Hildebrand** (University of Arizona)

## *Dædalus* Examines “Growing Pains in a Rising China”

What challenges confront twenty-first-century China, and how might their resolution influence the country’s (and indeed the world’s) trajectory? The Spring 2014 issue of *Dædalus* considers China’s problems as the growing pains of a still developing country, not necessarily as the death pangs of a Communist state doomed to imminent extinction. Through exploration of the complex domestic issues facing contemporary China, the contributors to the issue form a nuanced vision of the rapidly changing country, drawing global lessons from both its failures and accomplishments.

The issue is guest edited by Academy Fellow Elizabeth J. Perry, the Henry Rosovsky Professor of Government at Harvard University and Director of the Harvard-Yenching Institute. In her introduction, Perry notes that through three decades of “reform and opening,” China has transformed from one of the globe’s most impoverished countries to owner of the world’s second largest economy. But China now faces the consequences of this growth and the policies that spurred it, including environmental devastation, health and income inequality, a declining workforce, and widespread grassroots protest that bespeaks the tension between an authoritarian state and its market economy.

Perry argues that while China is in many ways unique, scholars and policy-makers can benefit from comparisons between China and the developmental states of East Asia, late developers like India and Brazil, and economic powerhouses, including the United States. As Perry writes, “We would be foolhardy to disregard or discount China’s efforts to resolve global problems simply because we predict that its political system is some day destined to disappear.”

Among the issue’s fifteen essays, Guobin Yang (University of Pennsylvania) examines how Internet activism continues to grow and adapt to the changing forms of state control. Robert P. Weller (Boston University) explores the remarkable growth of religious practice in China and outlines the political challenges of increasing religious diversity. And William C. Kirby (Harvard University) considers China’s potential for leadership in global higher education, asking, “Can ‘world class’ universities – however they are defined – exist in a politically illiberal system?”

Print and Kindle copies of the new issue can be ordered at: <https://www.amacad.org/publications/daedalus>. ■

### Spring 2014 *Dædalus* “Growing Pains in a Rising China”

Elizabeth J. Perry (Harvard University), *Growing Pains: Challenges for a Rising China*

Barry Naughton (University of California, San Diego), *China’s Economy: Complacency, Crisis & the Challenge of Reform*

Deborah S. Davis (Yale University), *Demographic Challenges for a Rising China*

Martin King Whyte (Harvard University), *Soaring Income Gaps: China in Comparative Perspective*

William C. Hsiao (Harvard University), *Correcting Past Health Policy Mistakes*

Mark W. Frazier (The New School), *State Schemes or Safety Nets? China’s Push for Universal Coverage*

Mary E. Gallagher (University of Michigan), *China’s Workers Movement & the End of the Rapid-Growth Era*

Benjamin L. Liebman (Columbia Law School), *Legal Reform: China’s Law-Stability Paradox*

Guobin Yang (University of Pennsylvania), *Internet Activism & the Party-State in China*

Ching Kwan Lee (University of California, Los Angeles), *State & Social Protest*

Robert P. Weller (Boston University), *The Politics of Increasing Religious Diversity in China*

William C. Kirby (Harvard University), *The Chinese Century? The Challenges of Higher Education*

Jeffrey Wasserstrom (University of California, Irvine), *China & Globalization*

Joseph Fewsmith (Boston University) & Xiang Gao (Zhejiang University), *Local Governance in China: Incentives & Tensions*

Elizabeth Economy (Council on Foreign Relations), *Environmental Governance in China: State Control to Crisis Management*



## Public Higher Education & the Private Sector

On January 22, 2014, Robert J. Birgeneau (Chancellor Emeritus and Silverman Professor of Physics, Material Science, and Engineering and Professor of Public Policy at the University of California, Berkeley), Mary Sue Coleman (President of the University of Michigan), Philip Bredesen (former Governor of Tennessee), Don M. Randel (Chair of the Board of the American Academy, President Emeritus of the Andrew W. Mellon Foundation, and President Emeritus of the University of Chicago), and Frank D. Yeary (Executive Chairman of CamberView Partners and former Vice Chancellor of the University of California, Berkeley) participated in a conversation on the future of America's system of public higher education. The program, held at the University of California, Berkeley, served as the Academy's 2003rd Stated Meeting. The following is an edited transcript of the presentations.



### Robert J. Birgeneau

*Robert J. Birgeneau is Chancellor Emeritus of the University of California, Berkeley, where he is also the Silverman Professor of Physics, Material Science, and Engineering and Professor of Public Policy. He was elected a Fellow of the American Academy in 1987 and currently serves as Cochair of the Academy's Lincoln Project.*

One year ago at Berkeley, we publicly announced the Academy's *Lincoln Project: Excellence and Access in Public Higher Education*, which has now been fully launched. We have had a couple of meetings so far, and have quickly discovered that the work

**The Lincoln Project has brought together some of the most innovative minds in the country to figure out long-term solutions that will help stabilize public research and teaching universities and ensure that they maintain their public character.**

we have ahead of us will be exciting but also very challenging. Many of you know the challenges facing public higher education not only in the state of California, but also in the country as a whole. We have brought together some of the most innovative minds in the country to figure out long-term solutions that will help stabilize public research and teaching universities and ensure that they maintain their public character.

Tonight we will hear from several members of the Lincoln Project committee. First will be my cochair for the project, Mary Sue Coleman, who has been an extraordinary leader in public higher education in the United States. I will not list all the institutions that she has led, but for the last twelve years, she has been the President of the University of Michigan, one of our great partner institutions in public higher education. Soon she will transition out of that role and into private life, so we are extremely privileged to have her here tonight.



### Mary Sue Coleman

*Mary Sue Coleman is President of the University of Michigan, where she is also Professor of Biological Chemistry in the Medical School and Professor of Chemistry in the College of Literature, Science, and the Arts. She was elected a Fellow of the American Academy in 2001 and currently serves as Cochair of the Academy's Lincoln Project.*

All of us have seen that the value of higher education is increasingly challenged. That cost increases are higher than the rate of inflation is something that cannot continue, and we have to find ways to moderate costs. Right now we do not know what innovations will work, or whether the innovations will necessarily lower costs. Still, we need new ideas to ensure that students today have the rich experiences that have been a hallmark of our great public universities.

The Lincoln Project is seeking to position research universities in a new light for the nation. The name, of course, comes from President Lincoln, but in particular it pays tribute to his signing of the Morrill Act of

## **We plan to compile a great deal of data to help answer some of the most important questions: Why does college cost so much? What do students gain from college? Why should they have this experience?**

1862, which laid the groundwork for our public university system. We have some very important questions to answer, and we want to do it with evidence and data – some of which is hard to obtain or is difficult for laypeople to interpret. But having the platform of the American Academy is going to help us in these areas. We intend to listen carefully to the critics; it will do no good if we end up with a report that we are all convinced about but that others find unsatisfactory for various reasons.

We plan to compile a great deal of data to help answer some of the most important questions: Why does college cost so much? What do students gain from college? Why should they have this experience? We want to better understand how a region benefits from having a research university, which is something the public doesn't quite understand. We have put together a committee that includes leaders from higher education, business, government, and foundations so that we can all challenge each other to answer the hard questions and to defend the positions we take. One of our goals is to limit the type and number of universities that we include in our study. While we understand that the whole spectrum of higher education is important in this country – two year colleges, four year colleges, comprehensive universities, research universities – we want to limit this study to about one hundred research universities. We would like to cover all fifty states because we understand that this is a political process as well as one we want to be sure of in order to justify our findings.

We have established several committees, which have begun to meet to consider a specific set of questions. By this fall, we hope to publish the first in a series of white papers that will share our findings and recommendations with the broader public. Ultimately, our aim is to generate a new model, perhaps a new funding model, that will provide more financial stability to public research universities.

I am very excited to be part of this work because it is time that we stand up and justify this enormous resource that has been created over many decades and not let it slip away just because people do not appreciate what these universities mean to our country.



## Philip Bredesen

*Philip Bredesen served as the 48th Governor of Tennessee from 2003 to 2011. He was elected a Fellow of the American Academy in 2012 and serves as a member of the Academy's Commission on the Humanities and Social Sciences and the Lincoln Project.*

I live in Nashville, Tennessee, which is home to Vanderbilt University, a private research university. I have seen firsthand the many ways in which the presence of a major university enhances quality of life and economic competitiveness in a community or region. And public research universities in particular are extremely important to a state's overall strategy. First of all, they frequently broaden access by enrolling more lower-income students than a typical private university. Second, they can be persuaded more easily to be guided by the priorities and needs of their community and state. Here at Berkeley, for instance, I suspect that many programmatic decisions have been made in response to the economic opportunities in Silicon Valley.

Tennessee's public research university is the University of Tennessee, with locations in Knoxville and Memphis. Both campuses have an enormous impact on their respective regions and on the state's ability to respond to its challenges and opportunities. I think that the special perspective I bring

We spent more money on the two top drugs in that program than we spent on the whole of the University of Tennessee Medical School. These federal programs give states little option; we simply pay the bill when it is due, while other state investments take a back seat.

**We need to be able to make a clear argument, not that higher education is good in its own right, but that higher education is good in that it advances citizens' values and the things that they consider important for themselves, their families, and their state.**

to the Lincoln Project is having been the one, as governor of Tennessee, who had to cut the budgets of my state's universities in response to the fiscal challenges facing our state, especially after 2008. The flexibility that governors and legislatures have with their state budgets, particularly over the past twenty or thirty years, has declined dramatically with the growth of federal programs that require state contributions.

Consider the example of Medicaid, which in many states is the largest single expenditure (as it is in Tennessee). Medicaid didn't exist in 1965, but by 1981 Tennessee was spending half as much on Medicaid as on K-12 education; in 1992, Medicaid spending passed K-12 education. When I became governor, we were spending two-and-a-quarter times as much on Medicaid as on public education. Tennessee's situation is not unusual, with many other states facing the same problem. When I sought to talk with the public and the legislature to give them some perspective on the problem, I would explain that Tennessee's Medicaid pharmacy program alone was larger than what we spent on the higher education system.

From a governor's perspective, there are many good functions of state government worthy of funding. Higher education is a good thing; K-12 education is a good thing; pre-K programs and other children's services are good things. Forty-nine of the fifty states are constrained by either legislation or constitutional provisions that require them to have balanced budgets. States operate under a very different set of constraints than the federal government does: they have to make choices and find ways to actually pay for those choices.

I found that higher education often does not do a very good job of making the case for itself, and I would like to talk a little more about the kinds of arguments that I think will resonate with the broader public and the legislators who represent them. Many of the arguments from the higher education community assume that the value of what they do is intrinsic and obvious: higher education is good, college degrees are good, everybody knows it's a good thing to go to college, so why don't you understand this and provide the funding we say we need? And yet if you step back, you realize that the

source of all this money is people who work in factories, as bricklayers, as accountants – that is, all those citizens who are paying the state taxes that make this funding possible. We owe these people an accounting, and we need to be able to make a clear argument, not that higher education is good in its own right, but that higher education is good in that it advances their values and the things that they consider important for themselves, their families, and their state. That is an argument that I think higher education often fails to make.

When you become governor of any state there is a long line of people whose purpose is to extract more money from your budget than you are presently giving them. What you don't get so often – and what would be most welcome – is someone who brings to you a proposed solution to the problem. My hope for the Lincoln Project is that we will not simply make an argument about and publish a white paper on why public higher education is very important; but rather attempt to understand the problems that states and the federal government are facing and then offer some ideas about how to address them. If we can do that, the Lincoln Project will be helping solve the problem instead of being just one more petitioner for a larger check.

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### Don M. Randel

*Don M. Randel is Chair of the Board of the American Academy of Arts and Sciences. He is President Emeritus of the Andrew W. Mellon Foundation as well as President Emeritus of the University of Chicago. He was elected a Fellow of the American Academy in 2001.*

We have heard a certain amount in this country about our crumbling infrastructure, and yet we don't seem to be doing very much about that. But what is much less often talked about is our crumbling intellectual infrastructure, and it is that intellectual infrastructure that made the country as successful as it has been. Today, however, we are falling steadily down the list of developed countries in the amount that we invest in the intellectual infrastructure. We can ill afford this decline in fortunes. Unfortunately, higher education has many of the features of health care when we think about how to deal with it. And our success in viewing and discussing health care in this country does not inspire much hope for a more successful discussion when it comes to higher education. And yet it is crucially important.

The simple question is: who gets what type of education, and at whose expense? That immediately evokes many of the issues that are toxic in the national discussion at the moment. Who gets what type of education: that question suggests rationing, if not death panels. And at whose expense? If the problem of access to higher education is money, then you have to go where the money is and take it from there to give it to the places where it isn't. That is redistribution no matter how you want to talk about it, and that, too, is a fairly toxic concept – though we do it in all walks of life. Your automobile insurance, for example, is a form of redistribution. But we have to find our way through the ideological hot buttons in order to address the matter head-on. To do exactly what Governor Bredeesen says – that is, to find ways to reach people and help them understand what is in their interest – means that we must partly change some of the terms in which the issues are frequently discussed.

The main thing we have been fixated on in this country lately has been the high cost of higher education, and no doubt the cost has risen – indeed, has risen faster than inflation. There are very good reasons for that. In public institutions, especially where state support has declined, there has been no alternative but to increase revenues in the form of tuition. And in state universities like Berkeley or the University of Michigan, another thing that has happened is that the percentage of out-of-state students has increased, because they can be charged much more than in-state students, and one simply redistributes that income from the people out of state to the people in state. It is as if the solution to the funding of public higher education in America would be for every state institution to accept only students from other states. We lament the rate at which costs are increasing and argue that costs should not rise faster than inflation. However, a recent book by two econo-

**Public higher education is where the majority of students in the United States get their education, and that is an issue we have to address if we are to have not only a prosperous country, but a wholesome democracy.**

mists at the University of William and Mary shows that the rate of increase in the cost of higher education has been precisely the same rate as the increase in the cost of dentistry. Those two curves lie exactly on top of one another. Why is that?

It turns out that there is a limit to how many mouths you can examine in one day. You can upgrade the technology and hire more assistants in the dentist's office, but sooner or later you reach the limit of productivity gains. Higher education is a business (and this has been well understood for a long time) in which it is very hard to achieve productivity gains. So why don't we adopt more of the methods that could lead to productivity gains, you might ask. I can tell you right now how we could increase the efficiency of universities. We could go back to the way it was when I was first an assistant professor, in 1967. I taught twice as much as I did later in my career, and students came to campus, ate the food we put in front of them three times a day, and slept in a small room with a stranger of the same sex. The consumer pressure in this country is a huge part of what is now driving the cost of higher education, and the despicable rankings of *U.S. News & World Report* give only incentives to increase costs.

We have a big public education and public relations problem to face. It is not that higher education doesn't know how to become more efficient as an industry. I have been in higher education administration in one way or another since about 1970, when as a poor young fellow I was persuaded to become chairman of my department. In and

out of administrative roles over decades, I didn't have a single year when I wasn't cutting one budget or another. In the 1970s it was the orchestra budget. We had a very distinguished conductor, and we had to cut the budget of the orchestra to save money in the music department, losing an oboist who was also on the faculty. I could tell you many similar stories. The balancing act that universities have been through has been one of, at minimum, steadily trimming sails; but there is, as I said, a point at which you reach a limit, and it is clear that we have reached that limit in terms of the threat to the quality of the enterprise at a university like Berkeley. And Berkeley, let me say as a foreigner, is the greatest public university there is, and it enjoys the company of only a handful of other such universities (University of Michigan among them). To watch the systematic disinvestment in these great institutions is a terrible tragedy, one that the nation simply cannot afford. Thus the work of the Lincoln Project has as high a priority as any project possibly could. The American Academy is exactly the place to carry out this discussion and to form arguments in terms that the public can understand – and in terms that will lead higher education to do a better job of what it has been put in place to do. Public higher education is where the majority of students in the United States get their education, and that is an issue we have to address if we are to have not only a prosperous country, but a wholesome democracy.

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### Frank D. Yeary

*Frank D. Yeary is Executive Chairman of CamberView Partners LLC. Previously he served as Vice Chancellor of the University of California, Berkeley. He is a member of the Academy's Lincoln Project.*

I have spent most of my life in the business world, but I served for four years as vice chancellor here at Berkeley. I am calling my talk tonight “Common Ground” because, as I will discuss, there is a lot of common ground between the business world and public universities in particular.

Having spent time in higher education administration, I am aware that there is a tendency at universities to be skeptical of what business leaders say and think. So when Mary Sue and Bob asked me to be part of tonight’s program, I had an image of a fish swimming upstream. But I am happy to wade in the water as long as you understand that I am sharing with you what I think are very common perspectives among business leaders about the future of public higher education. The good news, and it is good

news, is that most businesses really do care about the students you educate, and they believe that the students you educate are critical to the success of businesses.

During the golden age of the 1950s and 1960s, public universities grew dramatically and were seen as a leading player in the advancement of both industry and the economy in every state where they operated. Universities were highly supported by very involved business leaders, and we

There is a broadly held view in the business community that states are not going to come back to help higher education, and that K-12 education, public pensions, and medical costs will consume all of the available money (not that there is necessarily all that much money available for these other programs). Business leaders hope that universities have figured this out, and that they are charting a course to success that counts on that reality.

**The good news is that most businesses really do care about the students you educate, and they believe that the students you educate are critical to the success of businesses.**

need only to go back and look at the list of UC Regents during that era to see that it was a Who’s Who of state leaders. Phil Boyd, who at the time owned everything that we now know as Palm Springs; Dorothy Chandler, whose family ran the *Los Angeles Times*; Katherine Hearst; Chester Nimitz; Norton Simon; and others: these were the regents of the University of California. They devoted their time, energy, and money, and they cared deeply about the university’s success. They were the most important people in the state, and they dedicated themselves to public education.

Now, we all know the story since those golden years; it has been told by the speakers ahead of me and doesn’t need to be repeated by me. In short, it is a story of a nearly fifty-year trend of putting other priorities above higher education. And unfortunately, this trend continues to this very day. Here in California, the legislative analyst’s office in Sacramento recently suggested that Governor Brown’s budget will take UC’s share of the general fund below 3 percent for the first time ever in 2014 – 2015.

Most of us in this room know certain things about higher education – about its value, its successes, and its necessity. It is nice that we all know this, but it would be much nicer if we had better facts and more friends to help us aggressively make our case. At the moment, I believe that we are in the process of losing the audience. We are losing the voters, the parents, and even the students. And it is no surprise that a large part of this disenchantment has to do with costs. I recognize that there are debates about the accuracy of some of the cost arguments circulating among the public, and no doubt there are many fine things being done in terms of financial aid and access at many colleges and universities; but it is absolutely essential that leaders in public higher education make a commitment to bend the cost curve and seek help in doing it. Once they have made that commitment and have begun efforts toward it, then we need to publicize that. We need to show that we live in the same real world as our fellow Americans.

Recent data show that for the first time, most unemployed people in America today

have some college education. It is still true that the best ticket out of unemployment is a college degree, but today there are too many young people who have large student loan obligations and are working the same kinds of jobs as their high school friends who didn't go to college. There are plenty of journalists who want to write this story, which means we have a big PR challenge. But there is something else here. Not enough students are well prepared for life in the working world. This is a challenge that we should openly discuss and embrace because we are well served to fix it. As the country has embraced a strategy that asks students to be more responsible for the cost of their education, students themselves are clearly taking notice. A recent study of currently enrolled students showed that nine out of ten of them identified student loan debt as a problem.

Since I left Berkeley eighteen months ago, I founded a technology company that is helping young adults take control of their personal financial challenges. We interviewed hundreds of people ages 18 to 35, and by a long distance the most emotional issues that they talked about were their student loans and how the servicing of these loans forced them into certain difficult choices. Student loan debt, which now is over \$1 trillion, is a big issue for universities. When you combine this problem with others, such as the public perception that universities don't keep their costs under control, you see the major challenge we face in gaining public trust and support.

In many cases, states have abandoned public universities as reliable partners, and we are now embroiled in an uncomfortable debate about costs and the value that universities deliver. We would be wise to find powerful new friends, so that we can create a big tent of supporters who truly want to help us succeed. Business is the natural ally of public universities. Why? Because public universities are the best option for

producing in large numbers a competitive workforce in a global economy. In addition, public universities support and produce groundbreaking research, especially basic research, that improves productivity for everyone. According to the Association of American Colleges and Universities, these are the top five skills that business leaders look for in new hires: critical thinking, complex problem solving, written communication, oral communication, and applied knowledge for the real world. A strategy that acknowledges these critical skills as well as the part universities can play in developing them among their students would go a long way in helping to create a strong partnership between business and higher education.

As I said at the outset, universities and businesses share many common goals. If their interests are more aligned, there are plenty of resources to bring to the table. Today, business spending on R&D dwarfs by a long distance the money spent at universities. To be fair, much of this money is spent

**Not enough students are well prepared for life in the working world. This is a challenge that we should openly discuss and embrace because we are well served to fix it.**

on the development side of R&D; nonetheless, we can imagine the common ground here. Indeed, there are many efforts already under way along these lines. At Intel Corporation, where I am a member of the board of directors, we donate \$100 million a year to a foundation that helps teachers improve their teaching, and students their learning, in STEM fields. That is a lot of money, but we believe it is in the interest of society and also in the interests of our company, because chances are if a student or teacher is using a computer, it is often with Intel technology.

STEM jobs are the fastest growing job sector in the economy today. Over the next five years, STEM jobs requiring a four-year degree will grow from half of all STEM jobs to two-thirds. Yet growth in the number of STEM majors is the lowest of any academic category on college campuses, and women, African Americans, and Hispanics are all significantly underrepresented in the STEM fields. Business leaders would say that we are doing our best to produce high-paying jobs, so we need a partnership that helps us solve some of these problems. This is a terrific opportunity for public universities and business to find common ground and make incremental, valuable progress.

The opportunity exists to create a public/private partnership around funding, whereby the federal government, business leaders, and philanthropists would together play a major role in bringing resources to bear. And if those groups showed a unified front, they might even be able to squeeze some money out of the states. This is just

one idea for how business and universities can work together, and it happens to be the topic of a white paper that Bob and I co-wrote a couple of years ago and presented in Washington, D.C. There may be better ideas out there; the key is just to get started sharing ideas.

What tools do universities have to help them succeed in the face of great challenges? I happen to think that they have a full toolbox. We have brilliant faculty, a dedicated staff, very loyal alumni who will do amazing things if we just ask, fearless

students who do amazing things even when we don't ask, irreplaceable and magnificent campuses in the center of cities all over the country, and a tradition of delivering on the promise of education. But I believe that public universities have a secret weapon: nearly everyone wants us to succeed. There is a deeply embedded view that at the core of democracy is the ability of people to better their position, especially through education. As great as the Princetons and Stanfords are in our higher education landscape, the average middle-American kid doesn't believe that he is going to one of these schools; but he does believe he can go to Michigan or Virginia or Tennessee or Berkeley. We have the ability to rally this spirit, and one way to do that is simply to reach out and involve all our constituents in our future success.

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### Question

Why are STEM majors more numerous in foreign countries, such as Japan and Korea, than in the United States?

### Mary Sue Coleman

My answer is pure speculation, but I would say that in most places in Asia, there is an enormous family value in education, and in a way that doesn't exist in this country, or at least not to the same degree. Somehow we have created an environment where young people think that math is too hard and that they can't do it because they will fail, so they don't try. We haven't done a particularly good job of training our K-12 educators to teach math in an exciting and interesting way. So there are multiple layers to this problem, and it continues to be a confounding problem. It is not as if we haven't talked about the excitement in STEM fields and the opportunities available there, and it is still a matter of dragging people to the table. I am a scientist myself and have been interested in science from the time I was in junior high. Fortunately, I was encouraged in this pursuit, but a lot of students are not.

### Question

Could the panel comment on the idea that somehow the rise of the research university has led to the demise of the undergraduate experience?

### Don Randel

When you think about what Frank identified as the skills business leaders want in the people they hire, it has to be something about the ability to question received opinion and think differently, to doubt and then

to reimagine, as someone put it. A student at a research institution, where the entity is absolutely committed above all else to the rigorous questioning of received opinion, learns something very valuable just being in that environment. And we should never want to separate the research enterprise from the teaching enterprise because they are absolutely of a piece. What you want every undergraduate to do is to develop the research instinct, whether it is about novels or the periodic table or anything else. It is precisely the same thing that scientists and humanists are after: namely, stimulating that spirit of inquiry, the willingness and ability to look at a body of material, data of some kind, and find how it makes sense. You can do that with good books and you can do that with things in the natural world.

The difficulty is not that one doesn't want the spirit of research involved, but it does have something to do with the degree to which universities have been driven by rankings and other kinds of consumer pressure to hire stars. That certainly does happen. But also important is the fact that more and more of the teaching in universities of all kinds is being outsourced to migrant labor. Only 20 percent of the instruction that takes place in colleges and universities in America today is done by faculty members who have tenure or are on the tenure track. The rest is done by graduate students and adjunct faculty, many of whom cannot make a living on what they are paid. Just think about it: you could teach five courses a semester, three semesters a year, at \$2,000 per course and you would be living near the poverty level. That is one of the things that is unsustainable about our current situation. If we want to have quality teaching in institutions we will have to find a way to pay people to do it. But I don't think that the research enterprise is the driver of that problem.



**What we want every undergraduate to do is to develop the research instinct, whether it is about novels or the periodic table or anything else. It is precisely the same thing that scientists and humanists are after: namely, stimulating the spirit of inquiry.**

**Robert Birgeneau**

One of the things we do very well in research universities is to involve undergraduate students in the research enterprise. When I was a regular faculty member, I always had a significant number of undergraduates working in my lab, and the absolute majority of them, when they were about to graduate, would come by and say how their single best educational experience was in the laboratory, not in the classroom. So I think the research opportunities we offer our undergraduates are exceptional and are a part of their educational experience at research universities that would not be available at most institutions.

**Question**

Are you looking at other universities south or north of the border to help answer questions such as why tuition in the United States is so high? My second question has to do with Jeffersonian notions of education. While business is important, Jefferson thought the most important thing was citizenship and democracy. I myself am still teaching because I see it as a civic duty. My two questions are related: on the one hand is the issue of higher education's role in creating an educated citizenry, and how democracy is weakened when higher education isn't performing well; and on the other hand, the controlled comparison of other

countries that have free universities. This is important because just as we have seen people going to other countries for cheaper medical care, for example, so are young people going to other countries for a more affordable education.

**Mary Sue Coleman**

The residential experience that is given at a place like Berkeley or Michigan is quite different from the residential experience, or lack thereof, in some countries that do not charge tuition or have very low tuition. It is more of a mass education model. That is not to say that students do not come out being very proficient in the areas that they are studying. I also don't believe that faculty are compensated in the same way in a number of other countries. So I'm not sure how useful those comparisons will be for our work, though we should definitely have our minds open to anything.

On the argument about education as a great tool for democracy, I absolutely agree with you, but I don't think that it is a winning argument. We have become so focused in trying to justify our existence and why young people should get a college education, arguing that graduates are going to make \$1 million more in their lifetime and so on. So we have actually fed into this argument that education is a private good, not a public good. And so naturally the public says, if you're going to make \$1 million

more, then you pay for your education. So we have almost killed ourselves in some of the arguments we have made.

The more education we have as a society, the more tolerant we will be. There are good data to show that tolerance increases with education, because you become more likely to listen to other points of view. We seem to lack that skill in our country today.

**Robert Birgeneau**

I was president of the University of Toronto for four years, so I know a lot about the Canadian system. There are many things that they do well, and we will be profiting from that experience. But in terms of access, we do a better job here in the United States, and in California in particular, than in any other country in the world. At Berkeley, the tuition for students whose family income is under \$80,000 is \$0, and we have robust financial aid to cover living costs. I do not know of any other country that does that, or certainly none that does it as well.

I could not agree with you more about the importance of public education in maintaining our democracy and citizenship. I am not convinced that we can find a way to present that argument in a convincing manner to the people we need to provide us support. One of the challenges for the Lincoln Project will be to figure out the right language in order to express our arguments in ways that convince the people we need to convince.

By coincidence, the Conference Board of Canada is sponsoring a project that is an analogue to the Lincoln Project. Our projects have somewhat different approaches, but we will see what we can learn from each other.

**Question**

I wonder why women and minorities don't pursue more STEM careers. Where are the role models? I am in chemistry because I

had a wonderful woman chemistry teacher. In those days, if women teachers married they had to quit. Things have gotten a lot better than that, but I still don't see the women role models or the minority role models that would entice women into doing some of these things.

### Philip Bredesen

We are so often whatever we have become because of a wonderful teacher who ignited a passion or developed our capacity in a certain field or skill. I think we need to remember that anytime somebody tells us that technology is going to solve the problem. As we say in the music business in Nashville, after a certain point you don't need a teacher who tells you where to put your fingers, you need a teacher who can get you to practice. And the best flat-panel display in the world is unlikely to be successful at that.

### Question

This is not true always, but in many states where there is a very strong private institution, public institutions often have struggled for prominence. These days the top public institutions go head to head with private institutions, and private institutions are driving up the cost, I think, for all of us. Is there an appropriate role for private institutions to play in protecting public institutions? Because in the arms race, there's no way we can keep up.

### Don Randel

When you talk about private institutions, you have to start with what I think to be a fact. There are only four truly rich private institutions: Harvard, Yale, Princeton, and Stanford. All the rest – and I am including Columbia, Penn, Cornell, and Chicago – are in an entirely different world in terms of

finances. They, too, are going head-to-head with those four rich guys. As I said at the Mellon Foundation, Harvard, Yale, Princeton, and Stanford don't really need our money; we need to help Penn, Columbia, Cornell, and Chicago stay in the game with those guys. But the pressures for competition are, in the end, market driven. Suppose we decided to advertise our institutions by saying we are not going to pay what the market demands for the very best professors, but we think you should send your kid here anyway. Whereas parents want to send their kids to a place that has famous professors, the kid wants the famous professor to set aside what made him famous and devote all his time to this kid, and then pick up his research again later.

**We are so often whatever we have become because of a wonderful teacher who ignited a passion or developed our capacity in a certain field or skill. I think we need to remember that anytime somebody tells us that technology is going to solve the problem.**

There's a perverse set of incentives at work in higher education. One is the "winner take all" issue, whereby everybody wants to claim that their guys hit it out of the park more often than anybody else. Then there's the question of the amenities that one provides because the market demands it. There is the question of the kind of support for student life that is now required because we have a different kind of population; and as the demographics of the population change that will only get much worse. All the questions of completion rates and helping kids get through require a support network that is not going to reduce costs by any means. That said, we are all in this together. Public and private do indeed

need to get together to support the overall enterprise, but I don't think it is quite as simple as saying that the privates are visiting this problem on the publics (except in certain limited domains). It was, after all, the University of Texas that created a slush fund with which to raid California institutions when they were in trouble a few years ago. We have that to contend with.

### Frank Yeary

Increasingly, private institutions – the richest four to start with, but others as well – are realizing that they have a highly advantaged tax environment legislated by the federal government that allows them to have \$20, \$30, or \$40 billion endowments that

they pay no taxes on. Then they get huge resources from the federal government to do research, and then they get overhead that is more than what the public institutions get. So they have a sweet deal. Now fast forward ten or fifteen years, and if the truly great institutions in the country do not include UCLA and Michigan and Berkeley, then when you want to go to one of the great institutions in the country, you must go to a private university. If I were president of a private university I would very much fear that day, because that is a day that will be extremely uncomfortable with respect to many billions of dollars of tax breaks.

**Public universities are the best option for producing in large numbers a competitive workforce in a global economy. In addition, public universities support and produce groundbreaking research, especially basic research, that improves productivity for everyone.**

Don Randel

I would argue that the deal isn't quite as sweet as you make it out to be. At a place like Cornell or Columbia, endowment produces 10 or 15 percent of operating income max. At Princeton it is a real source of income. Endowment per student there is huge, and I don't know what they do with all that money. Their entire financial aid budget is supported by endowment, so every nickel of tuition is gravy. But that's at the limit. And then you talk about the question of research funds. The federal government simply doesn't pay the cost, at least not the full cost, of the research that we do, and so it's a money-losing business. The more you take in, the shorter you are; and I don't think that the privates are really any better off in that than the publics. But the main point is that we really are all in this together, and we do have to stick together in advocating the fortunes of higher education, but especially public higher education because that is where the students are.

### Question

At the very wealthy universities at least, it works that the extremely rich and the quite rich subsidize the not so well-off, and there's a huge amount of funds transfer from that. That is much less the situation at public universities. I am curious about other ways of trying to share the burden as far as tuition goes, particularly at public universities given the wide spectrum of students they serve.

Robert Birgeneau

At public universities like Berkeley or UCLA, the net cost for really low-income students is what we call a self-help level, and that is about \$8,000. It is lower at the elite privates. The problem is that here at Berkeley alone we have 4,000 undergraduates whose family income is under \$20,000, whereas at Stanford it is probably 200. So we have 20 times as many really low-income students whom we have to support with a financial aid package, and our funds just do not go that far. Because of our commitment to access for low-income students, the absolute number of low-income students we have is so large that there just is not enough money to go around. We have put a lot of emphasis on raising private funds for scholarships for low-income students, and we have been quite successful at that. But again just the sheer numbers of Pell grants (UCLA in fact has even more than we have at Berkeley) means that the amount of financial aid that we must offer to keep the self-help level down is enormous. ■

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## SILA – The Competing Interests Shaping the Future of our Planet

The Academy's 2005th Stated Meeting on February 12, 2014, featured members of the Catalyst Collaborative@MIT performing a staged reading of Chantal Bilodeau's play *SILA*. Set on Baffin Island in the Canadian Arctic, the play features a climate scientist, an Inuit activist and her daughter, an Inuit elder, two Canadian Coast Guard officers, and polar bears all grappling with the rapidly changing environment. The reading was followed by a panel discussion with Naomi Oreskes (Professor of the History of Science and Affiliated Professor of Earth and Planetary Sciences at Harvard University), Robert L. Jaffe (Jane and Otto Morningstar Professor of Physics at the Massachusetts Institute of Technology), and playwright Chantal Bilodeau (Artistic Director of The Arctic Cycle) about the competing interests shaping the future of our planet. The program included a welcome from Alan Lightman (Professor of the Practice of the Humanities at the Massachusetts Institute of Technology) and an introduction of the staged reading from Debra Wise (Artistic Director of the Underground Railway Theater and Codirector of the Catalyst Collaborative@MIT). An edited transcript of the discussion follows.



## Naomi Oreskes

*Naomi Oreskes is Professor of the History of Science and Affiliated Professor of Earth and Planetary Sciences at Harvard University. She was previously Professor of History and Science Studies at the University of California, San Diego, and Adjunct Professor of Geosciences at the Scripps Institution of Oceanography.*

Recently I have been thinking about how to communicate the meaning of climate change. I spent a big part of the last fifteen years at the Scripps Institution of Oceanography, where I spent a lot of time with experts who worked on atmospheric and oceanographic issues related to climate change. So I have spent a lot of time trying to understand the scientific evidence and the arguments that scientists have made about this issue. While there is no question that the data are tremendously important, what I also started to understand was how scientists – wonderful, brilliant people – were not in fact reaching most people. When we started talking about what came to be known as “the communication problem,” most scientists at the time thought

**I realized that until we talk about the meaning of climate change for us – for people, for plants and animals, for the natural environment we depend on for life, sustenance, food, shelter, and beauty – we would not in fact move society.**

that if we talked about improving communication, it meant simplifying a graph or trying to speak without so many equations. In short, the idea was that the problem of climate change is so technical that people are not sufficiently scientifically literate to understand it; and so the problem of communication was a problem of simplification or, as some people would say, “dumbing down” the discussion of the issue.

However, I started to come to the conclusion that scientists were misdiagnosing the problem, and if you misdiagnose the problem, then your solutions are unlikely to be effective. I started to feel that the real problem was that people didn’t understand why climate change mattered for us, that they didn’t see that things we care about are at stake. I realized that until we talk about the meaning of climate change for us – for people, for plants and animals, for the natural environment we depend on for life, sustenance, food, shelter, and beauty – we would not in fact move society. So I began to experiment with trying to communicate in a different genre, and that is why I am so excited to be here tonight, because I believe that it is crucial for artists to become part of the conversation. It is important for us to think about the emotional and aesthetic aspects of these issues and to find ways to talk about those things without being discredited by our academic colleagues.

One line in tonight’s reading was about how science and politics should not mix. This is in fact what most scientists believe, and in some ideal way, what I believe, too. In

theory, the world would be a very fine place indeed if we could do science in a pure intellectual and epistemic way: answer questions about this amazing natural world that we live in and have that be a purely intellectual endeavor. The dream of pure science is one that moves me very deeply. But I also know that this dream does not match reality, and scientists who choose to ignore this truth do so at their own peril. My book *Merchants of Doubt* was an attempt to understand the explosive mix that has developed around the question of climate change, and the ways in which science and politics have collided in this domain. One of the things I learned by working on that project was the danger of scientists’ attempts to resist the reality that science and politics are in this together.

I began to see how the debate about climate change really is not a scientific debate; that is to say, it is not an argument among scientists about the facts of climate change, but rather a political argument about the implications of climate change. I should pause to clarify that I am talking about *anthropogenic* climate change: change caused by human actions, such as the burning of greenhouse gases or deforestation, not natural variability. The scientific recognition of the facts surrounding anthropogenic climate change has huge implications for the way we live and how we organize our economic system in the industrialized West. So the problem begins with science because it was scientists who recognized the potential of greenhouse gases and deforestation to change Earth’s climate; it

**I began to see how the debate about *anthropogenic* climate change really is not a scientific debate; that is to say, it is not an argument among scientists about the facts of climate change, but rather a political argument about the implications of climate change.**

was scientists who first began to talk about it as a potential problem; it was scientists who recognized the political consequences of climate change; and it was even scientists who began to recognize the economic consequences as well. But scientists were not prepared to grapple with all the economic, social, moral, ethical, and aesthetic implications, and so they left a kind of vacuum that has been filled by disinformation and obfuscation.

I once asked a colleague, a physicist, why, when all of this denial and disinformation began to come out, he didn't say something. His response: "We knew it was garbage so we just ignored it." One of the lessons of the last twenty years is that that approach just won't work. We would not let garbage pile up on our front lawns and think that it would

somehow go away on its own. What we have learned is that the garbage of industrial civilization, the contaminants we put into the atmosphere—the CO<sub>2</sub>, the methane, the CFCs—they do not go away. And left alone, disinformation doesn't go away either.

However much we might want science and politics to be separate, however much we might dream of a world in which they are separate, that is not the world that exists. The most important thing that we can do moving forward is to find ways for scientists and people in politics, economics, and the arts to work together to see this as a team project. With different insights from these diverse domains, we can come together to solve this very profound problem.





## Robert L. Jaffe

*Robert L. Jaffe is the Jane and Otto Morningstar Professor of Physics at the Massachusetts Institute of Technology. He was elected a Fellow of the American Academy in 2013.*

There is deep, diverse, and robust evidence that if we continue to dump greenhouse gases into the atmosphere, cut down forests, and change our biological systems, we will profoundly affect Earth's climate in ways that will reverberate for ages. It was particularly impressive to see this, through tonight's reading, in the context of the Arctic, because that is where climate change has shown itself most early and most impressively so far, and where scientists agree that change in mean temperature is going to be most severe. The impact on indigenous cultures will be massive; it will be comparable to the impact of the first encounters with Western civilization, and it will profoundly change the nature of life in the Arctic. I became interested in climate change through a course I developed at MIT on the "Physics of Energy." I am not

an expert on climate science, but this year I am chair of the American Physical Society's Panel on Public Affairs, which puts me very much in the middle of the debate on how scientists understand Earth's climate and how they evaluate the effects of climate change.

It is really important to get the science right, so I would like to make a plea in my short time for further support of climate science research. One of the reasons why

century-and-a-quarter of work on climate science, and furthermore the IPCC's statements are couched in probabilities. They say, for example, that there is a 95 percent likelihood that human-emitted greenhouse gases were responsible for more than half of the change in temperature in Earth's mean surface temperature since 1950.

We are confronted with very difficult scientific problems. We don't know the range of natural climate variability. This has

## **Our government doesn't fund climate science research adequately, and the scientific community and the quality of public debate are suffering as a result.**

climate deniers have had success is that the state of climate knowledge is still woefully inadequate to take a full inventory of the extent of the effects that we will face. Climate is a noisy, driven, non-equilibrium system with nonlinearities across all kinds of scales of distance and time. It is as complex a problem as scientists have had to deal with; comparable to the most difficult problems in fundamental research. The Intergovernmental Panel on Climate Change (IPCC) has just released the first part of its fifth report on the physical basis of climate change. At a length of 1,500 pages, it is hard to carry, to say nothing of what it is like to read.

In 1896, the Swedish physicist Svante Arrhenius made the first estimate of what is called the climate sensitivity parameter, that is, how much Earth's mean surface temperature would be expected to rise if the carbon dioxide content of the atmosphere doubled. His estimate was 2 to 5.5 degrees centigrade. In the new report from the IPCC, they estimate the same parameter and put it somewhere between 1.5 and 4.5 degrees centigrade. Not much improvement after a

proven to be a severe complication in the latest review because Earth's mean surface temperature has risen only slightly over the last fifteen years. It rose dramatically from 1990 to 1998, but after 1998 it stayed at this new high level without increasing much in the fifteen years that followed. There is no clear explanation for this. Some of it is attributed to the El Niño southern oscillation, a long-term natural variability in climate. Some of it may be because of a lack of understanding of the interactions between the deep ocean (that is, the ocean below 700 meters), the surface thermodynamics of the ocean, and the atmosphere.

To put the importance of reducing uncertainties in perspective, all the global warming anticipated by the median consensus expectation between now and 2050 would be accommodated by an average temperature rise in the ocean on the order of 0.1 degree centigrade if the entire ocean warmed. That is not likely to happen; in fact, there is lots of evidence that deep ocean does not participate in these dynamics. But the research needed to further explore and improve our

understanding of such issues is woefully underfunded (if funded at all). The situation is similar for atmospheric research, in particular for obtaining measurements in the high troposphere throughout Earth's temperate and equatorial regions. Our government doesn't fund climate science research adequately, and the scientific community and the quality of public debate are suffering as a result. Climate change deniers are able to stoke controversy because of the absence of clear resolution on some of the more fundamental questions.

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### Chantal Bilodeau

*Chantal Bilodeau is a New York-based playwright and translator. She serves as Artistic Director of *The Arctic Cycle* and is author of the blog *Artists And Climate Change*.*

One of the goals I gave myself in writing this play (and the other seven to come) was to bring as many people to the table as possible. I wanted people from various disciplines to engage in conversation, using the play as a stepping-stone. Tonight is a great example of that and it gives me enormous hope for the impact these plays can have.

I started working on *SILA* in 2009 with a commission from a theater in San Diego that was interested in a play about the intersection of race, class, and climate change. I had not long before that returned from a trip to Alaska. It was my first time in the Arctic, and the place really captured my imagination.

This was in 2008–2009, and at that time I had not yet encountered any plays that dealt with climate change. During those years, there was a lot of talk about the open-

**The climate change issue is very polarized. . . . It is understandable and probably good for all of us to feel passionate about what we believe in, but we have to be able to listen to each other and work together.**

ing of the Northwest Passage in Canada so I started looking into that. And I decided that to really understand that area and the people who live there, I had to go in person. So after doing research at home and setting up some meetings, I left on a three-week trip to Baffin Island. I came back with my views completely changed. I had set out with the idea of writing what we think of as the traditional play form: one narrative, one point of view, one issue being addressed. By the time I came back, I knew that structure wasn't adequate because what I encountered was so much more complex and interwoven than I expected. I realized that the play had to include multiple narratives, multiple voices, with all of them given equal value. For me, this was the best way to capture the complexity and interconnectedness of the people and issues I encountered in the Canadian Arctic.

Stories from many of the people I talked to ended up in the play, sometimes as is and sometimes modified. One person in particular was a big inspiration: Sheila Watt-Cloutier, an Inuit activist and runner-up for the Nobel Peace Prize the same year that Al Gore received the prize. I was in contact with an Inuit organization in Ottawa, and the woman I talked to there basically handed me Watt-Cloutier's email



address. She was busy, but she gave me an hour of her time and shared her views on climate change. My encounter with her really influenced how I wrote the play.

Something else that was really important to me with this play was to stay away from radical thinking. The climate change issue is very polarized, and that is not helpful. It is understandable and probably good for all of us to feel passionate about what we believe in, but we have to be able to listen to each other and work together. So if there is a point that the play makes, I hope it is this one.

*SILA* is the first play in a series of eight plays, one for each country of the Arctic. I started with Canada, which is where I am originally from and the country I know best. I have also written a draft of the second play, which is set in Norway after I went on a sailing expedition around the Svalbard archipelago in 2011 to do research. We presented a reading of the play in Oslo this past December and I was a little nervous about Norwegians' reaction to an outsider looking at their culture and writing about it. But people were very supportive and actually happy that someone was looking at their stories and talking about them. I am hoping to be able to continue developing that play there. My two most important goals with this series of Arctic plays are to bring as many people to the table as possible; and to be able to have each play done in the country where it is set, as a way to make the climate change conversation even richer and more international than it is.

## Discussion

### Naomi Oreskes

If we ask ourselves, what do we need to do, that question will not be answered by better climate models or more refined analyses of ocean heat uptake. These things are legitimate, but they are not the point. We need to be able to answer questions about how we get improved energy technologies; we need to be able to answer questions about public acceptance. I don't agree with the suggestion that the reason why there is so much debate about climate science is because the science has fundamental uncertainties. I think the evidence is against that proposition.

We know something about why people are in denial about climate change. We know where the contrarian movement comes from, and it is not because the science is uncertain; the evidence of that is

**The need to understand the scope of what we have to deal with is an important ingredient in developing sensible policy, and we cannot do that without a better understanding of the science, a better understanding of the models, and better data.**

overwhelming. If we are scientists, empirically oriented with a deep belief in data, then we should be paying attention to that evidence. We do need to do research, but it is not more research on the details of the climate system. We might want to do that because we want to understand the climate system as scientists, but in terms of addressing climate change, it is questions about energy and about policy that we need to be asking. We know that a tax can be an effective policy instrument, but we don't know the conditions under which people accept taxation. There are all kinds of inter-

esting and important intellectual questions that are more grossly underfunded than climate science.

We have been confused about what it is that we need to do, and the scientific community could play a really helpful role here – a brave role in fact. Scientists could stand up and say yes, we love and care about science, we want to understand the natural world better, but in terms of what we need now I believe there are more urgent things needed.

### Robert Jaffe

Climate change skeptics and critics continually point to the weaknesses in the fundamental science. Whether they are justified in doing that and whether we should pay attention to it may not be the question, but these people have the ear of public policy-makers; they come forward and claim

that we don't understand climate science any better than they did a hundred years ago. They say we don't understand whether the deep ocean can soak up this heat and not result in significant changes to the climate. Improving the scientific basis will give us the weapons to confront that discussion from the point of view of knowledge rather than ignorance.

Furthermore, it makes a tremendous difference to the way we will persevere as a society whether sea levels go up by 10 centimeters, 1 meter, or 3 meters by the end of the twenty-first century. The peo-

### **The stories that Inuit hunters have told themselves for thousands of years, that help them deal with the climate, food, hunting, where it is safe to go, when it is safe to go – those stories are not as reliable anymore because things are changing so fast.**

ple in Bangladesh would do well to know that, and we cannot answer that question until we have better estimates on the interaction between the atmosphere and the ocean. So it is not that this should influence the decision to put a tax or price on carbon. We should be taking those policy steps now, and scientists should speak out. Scientists have an active and important role to play in partnering with policy-makers to address this problem quickly. Frankly, it may already be too late, as you probably know, because of the lifetime of carbon dioxide in the atmosphere. But the need to understand the scope of what we have to deal with is an important ingredient in developing sensible policy, and we cannot do that without a better understanding of the science, a better understanding of the models, and better data.

#### **Question**

Let me postulate that the science is inadequate to answer the question of whether sea-level change will be 10 centimeters, 3 meters, or 10 meters in 50 years, that it will be 50 years before we know the answer to that question. This is an inference about the maturity and state of the science. There is a kind of touching faith that another five or ten years is going to give us the answers to those questions. One of the reasons for what Professor Oreskes has picked up on – that the science community has been loath to get involved with the politics – is that the science is not mature enough to say what will

happen. The science is mature enough to tell you what the risks are. Risk analysis is not science as we normally do it, and as everybody knows, tolerance for risk, both individually and at a societal level, is extremely broad. And so there is a mismatch here. There is the faith that if we do more research, somehow it is going to give you the answer. And it is probably going to be a hundred years before we understand this problem well enough to answer the urgent questions. What does society need to do when the science is not mature enough to give you definitive answers?

#### **Naomi Oreskes**

My experience of climate scientists is that they talk in the future tense because it is easier to talk about the future than the present, because nobody really knows what will happen in the future. Bringing the discussion back to the present and bringing it back to the human level and the impacts that are already being felt helps make it a real issue for people. It also makes it not just about future risk, but present reality.

#### **Chantal Bilodeau**

Something that was very poignant to me when I went to the Arctic was to see and hear how fast the changes were happening. I felt we needed to capture those stories now because in twenty or thirty years, they won't be around. Even the Inuit way of life will be completely different because of the changing environment. The stories

that Inuit hunters have told themselves for thousands of years, that help them deal with the climate, food, hunting, where it is safe to go, when it is safe to go – those stories are not as reliable anymore because things are changing so fast. So this is a really important moment in history.

#### **Question**

What is the advantage if we all acknowledge that these stories have value and should be told to galvanize the public or to raise our consciousness? You could have interviewed these people and then have chosen to write a nonfiction book or make a documentary film. Can you tell us what you see as the advantage of doing a theater piece versus a nonfiction book or film?

#### **Chantal Bilodeau**

I wouldn't say one form is better than the other. Theater has the advantage of bringing people together in the same room. It is rooted in ritual; there is a celebration of something when we go to the theater – it is almost like going to church. You celebrate human nature, and you experience something very deeply and very intimately in a room full of people. It has a certain power that other art forms do not. ■

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To view or listen to the presentations, visit <https://www.amacad.org/sila>.

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# The Humanities in the Digital Age

**O**n January 23, 2014, the Academy hosted a meeting at Stanford University on The Humanities in the Digital Age. **Richard Saller** (Vernon R. and Lysbeth Warren Anderson Dean of the School of Humanities and Sciences and Kleinheinz Family Professor of European Studies at Stanford), **Elaine Treharne** (Roberta Bowman Denning Professor of the Humanities and Codirector of the Center for Medieval & Early Modern Studies at Stanford), **Franco Moretti** (Danily C. and Laura Louise Bell Professor and Professor of English and Comparative Literature at Stanford), **Joshua Cohen** (Marta Sutton Weeks Professor of Ethics in Society; and Professor of Political Science, Philosophy, and Law at Stanford), and **Michael A. Keller** (Ida M. Green University Librarian; Director of Academic Information Resources; Publisher of the Stanford University Press; and Founder/Publisher of HighWire Press at Stanford) discussed the humanities in the context of rapidly developing new technologies. The program served as the Academy's 2004th Stated Meeting. The following is an edited transcript of the presentations.



## Richard Saller

*Richard Saller is the Vernon R. and Lysbeth Warren Anderson Dean of the School of Humanities and Sciences and the Kleinheinz Family Professor of European Studies at Stanford University. He was elected a Fellow of the American Academy in 2005.*

**T**he title of this evening's program, "The Humanities in the Digital Age," captures both the sense of possibility for the humanities with the rapid development of new technologies, and also the sense of foreboding that comes from feeling threatened by obsolescence. There is perhaps no better place than Silicon Valley to explore this issue. Our four speakers will present some tantalizing examples of the possibilities for extending humanities research through new technologies. But Josh Cohen, who always surprises me, has told me that he has changed his subject since he last wrote to me, and that he is actually going to take a bit of a contrarian's view on the limits of digital technology in the humanities – that is, he will look at what it won't do. And I think that is a very important subject.

Our first speaker is Elaine Treharne, the Roberta Bowman Denning Professor of the Humanities, whose home is the English department here at Stanford. Elaine's education was in the field of Old English, with a focus on early British manuscripts: their materiality, contents, and context of production and reception. What makes Elaine especially appropriate for this evening's program is that she places the medieval manuscript in the much broader suite of technologies related to texts.

Next will be Franco Moretti, the Danily C. and Laura Louise Bell Professor of English and Comparative Literature. Franco has done many things at Stanford, as well as writing prodigiously, but relevant here is that he is founder of the Center for the Study of the Novel and founder of the Literary Lab.

Our third speaker will be Josh Cohen, the Marta Sutton Weeks Professor of Ethics in Society; he is also Professor of Political Science, Philosophy, and Law. He is a political theorist trained in philosophy, a principal investigator in the program on liberation technology at the Freeman Spogli Institute for International Studies, and Editor of *Boston Review*.

Finally we will hear from Michael Keller, the Ida M. Green University Librarian, Director of Academic Information Resources, Publisher of HighWire Press, and Publisher of Stanford University Press. These titles touch on his major professional preoccupations: that is, a commitment to supportive research, teaching, and learning; the effective deployment of information technology hand-in-hand with materials; and active involvement in the evolution and growth of scholarly communication.

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## Elaine Treharne

*Elaine Treharne is the Roberta Bowman Denning Professor of the Humanities and Codirector of the Center for Medieval & Early Modern Studies at Stanford University.*

As a medievalist and book historian, working on text technologies from c. 60,000 BCE to the present day – that is, from inscribed rocks to Flickr and YouTube – I find it both exciting and exhausting to be part of the digital age during its infancy. The opportunities that digital technologies afford are potentially limitless. Currently, though, we are hamstrung by our print-culture perspective. That is, in these decades of transition, we are only slowly moving away from the fixedness of the page, from the ostensibly static nature of word and image on paper, from the lexis of the book, the scroll, the text, the author, the reader.

Indeed, it was twenty-one years ago, in 1993, after substantial work on the early eleventh-century *Beowulf* manuscript held at the British Library, that Anglo-Saxonist Kevin Kiernan recognized the potential of digital photography for reclaiming lost

## Open access is a major advance for the community of scholars and other interested parties who want to see, study, and teach from digital primary sources held at thousands of repositories globally.

portions of the codex. As Andrew Prescott reveals in his account of events, with a digital camera, Professor Kiernan produced a high-resolution, 21-megabyte image of the badly burned manuscript, originally part of the library of Sir Robert Cotton (the Cottonian library), which formed the basis of the British Library. Having saved the image to an external hard drive, which was subsequently erased by security equipment at Gatwick Airport, Kiernan was glad that he had also transmitted the image via an expensive, hours-long telephone call from London to his home in Kentucky. This transatlantic transfer of a digital image was quite likely the first of its kind – a historic moment indeed, and especially for *Beowulf* studies, because it opened the window for the reparation of many obscured and partial readings damaged by fire and water.

Now, if I want to examine the *Beowulf* manuscript, it is available by way of open access, courtesy of the British Library. I should, however, add a “what you see is what you get” warning: none of the detailed work recaptures lost graphemes, for example; none of it recaptures the high-quality imaging that Kiernan was able to do (and has subsequently gone on to do). Open access, then, is a major advance for the community of scholars and other interested parties who want to see, study, and teach from digital primary sources held at thousands of repositories globally. Rare-books scholar William Noel, of Archimedes Palimpsest fame, has overseen the publication of the holdings of the Walters Art Gallery, the images of which are hosted here and at the Schoenberg Institute for Manuscript

Studies at the University of Pennsylvania. The British Museum has long been moving toward open access, with eight hundred thousand digital objects, including eleven thousand manuscripts now available. The Wellcome Institute in London and Trinity College, Cambridge, have just joined the ranks of the open access crowd. When all primary materials are open access, free to reproduce and use in scholarship, then the goalposts will have moved substantially. A real danger, though, is selective open access or digitization: the privileging of the pretty and the re-canonization of already well-known corpora. This has serious knock-on effects for all research and funded projects, when all the project team has access to work with and display freely is a fraction of what actually exists in libraries, archives, and museums worldwide.

Still, there is the thrill: like me this morning in my study at home, all-comers can travel to London to see the Lindisfarne Gospels in a digital display, where the detail of the manuscript is available in a way that simply is not possible otherwise, at a level of decorative amplification equaled only by the experience of an actual user leaning over the codex with magnifying glass in hand. My students, or high school students, or students at the smallest college with no manuscripts of its own can travel with me to Philadelphia to view illustrations of jousting snails, or to Salisbury (whenever the Salisbury material might be made available) to pity the poor mouse squashed inside an eighteenth-century printed Suetonius. Obviously, not all manuscripts and printed books are accessible, often for reasons of preservation. Even

so, digital processing increasingly permits arts and humanities scholars the ability to gather sources for original purposes, utilizing new methods and new tools.

New tools and developments by project teams include those that permit graphemes to be repositioned in manuscripts in order to reconstruct areas that have been damaged over time; this was recently done with the later tenth-century anthology of Old English poetry, *The Exeter Book*, as scholars at the University of Glasgow managed to provide hypothetical readings of lacunae caused by a burning firebrand, probably in the later Middle Ages. Multiple forms of libroclasm, or the destruction of books, could in fact be silently and virtually mended by new digital tools. As Professor Monica Green at Arizona State University has suggested, new

connecting scholars with browser interfaces such as Mirador, and data-modeling services like Shared Canvas. These tools allow virtual textual communities to flourish in interoperable environments, where annotations, explanations, and transcriptions can be used to push scholarship forward, and to build valuable collaborative endeavors in which the latest knowledge can flourish and be openly shared. This will be the outcome, I think, of a new project at Stanford, “Global Currents, 1050 to 1900,” which received support from the National Endowment for the Humanities. Along with colleagues from McGill and Groningen Universities, we will use visual language processing and social network modeling to analyze how literary communication functioned across space and time.

## **New approaches to book history that have been facilitated by digital tools mean that we can virtually re-create medieval and early-modern libraries.**

approaches to book history that have been facilitated by digital tools mean that we can virtually re-create medieval and early-modern libraries through the analysis of early book lists and the amalgamation (in a digital space) of the books we know to have existed in a certain place a millennium ago. We will be able to map, visualize, statistically examine, and present results in fresh formats to a wider audience. The digital images permit us not only to identify, describe, evaluate, and mine data that have until very recently been completely overlooked – the marginal indications of use, the annotations, the doodles, the underlinings, the interlinear glosses – but also to become those very interveners in the manuscripts ourselves. The amazing work being done here in Stanford’s Digital Library Services by colleagues like Ben Albritton and his collaborators is

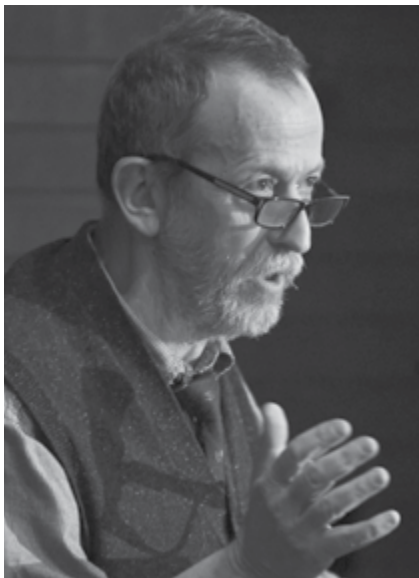
But in order to do this, theory and practice are essential – and perhaps more important, so is training. Large numbers of amateur and academic crowds can collaborate in inventive and fruitful ways in these initiatives. And at the undergraduate and graduate levels, it is critical that academics involved in digital humanities scholarship provide training to maximize the potential of new and probably game-changing information as well as new mechanisms of analysis. Numerous projects, like DigiPal at King’s College, London, and Inscribe at the IAS in London, are ensuring that carefully explained principles of description and interpretation are available, but only – and herein lies the rub – to those with reliable connectivity. It is arguably the most essential desideratum of digital humanities across the board that scholars equip the next generations with fundamental skill sets to

make the most of the mountains of data now available, and the whole ranges yet to come.

Generous training and collaboration in the interstices of science, technology, education, the arts, and humanities will inevitably lead to “creative chances,” to revisit C. P. Snow’s famous 1959 Cambridge lecture on the “two cultures” of arts and sciences. These creative chances are where much true innovation happens, often serendipitously. Even then, as my collaborator, Professor Andrew Prescott, has said to me, it’s not just about the digital. As amazing as it was when Kevin Kiernan sent himself that 21-megabyte image, heralding a small part of this new age, we should understand that something amazing is happening now, too. We need to develop a capacious recognition that developments in nanotechnology, for example, will help us preserve and conserve our immense cultural heritage, or that the Internet of Things will encourage and permit the creation of augmented forms of already-existing books, made richer with added digital data. There will be books and print with conductive ink or inbuilt hyperlinks and multimedia; they will be accretive and connected.

It is only through connections, networks, and collaborations that creative chances can happen – and not just between technologists, scientists, and humanists, but between artists, librarians, archivists, literary specialists, historians, and engineers. We all are cultural heritage practitioners, all digital humanists. For while information might expand, almost as if automatically, knowledge is learned; and while data increase exponentially, wisdom must be acquired. The digital is all very well, but the human outdoes it all.

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### Franco Moretti

Franco Moretti is the Danily C. and Laura Louise Bell Professor and Professor of English and Comparative Literature at Stanford University. He was elected a Fellow of the American Academy in 2006.

The first thing that happens when a literary historian starts using computers to think about literature is that the object of study changes. Not just the tool; the object itself. “The objects studied by contemporary historians” have this peculiarity, Krzysztof Pomian observed some time ago, that “no one has ever seen them, and no one *could* ever have seen them [...] because they have no equivalent within lived experience.” He was thinking of things like demographic evolution and literacy rates, and it’s true, no one can have a “lived experience” of these “invisible objects,” as he also calls them; our objects are different, of course; they are literary ones, but they too have no equivalent within the usual experience of literature.

So what are they like, these objects we study in the Literary Lab? They are things like Figure 1: The Correlation between Sentence Types (black vectors) and Common Nouns (in blue and gray).

This image comes from our recent collective pamphlet, “Style at the Scale of the Sentence,” and the full argument can be found at <http://litlab.stanford.edu/LiteraryLabPamphlet5.pdf>. Here, let me just say that the chart correlates a certain number of words, in blue and gray, with four types of clauses, indicated by the black lines, that are particularly significant in nineteenth-century

novels; we spent quite a few hours trying to understand the logic behind this distribution, and others like it. These are the objects we study. Or this – Figure 2: Types of Speaking Verbs by Decade.

The black segments at the bottom of the figure express the declining presence of loud speaking verbs, hence the “silencing” of the English novel that twenty-one-year-old Holst Katsma discovered in our database. This is what our objects are like. And no one had ever seen them because they exist *on a different scale* from that at which we typically experience literature: one that is simul-

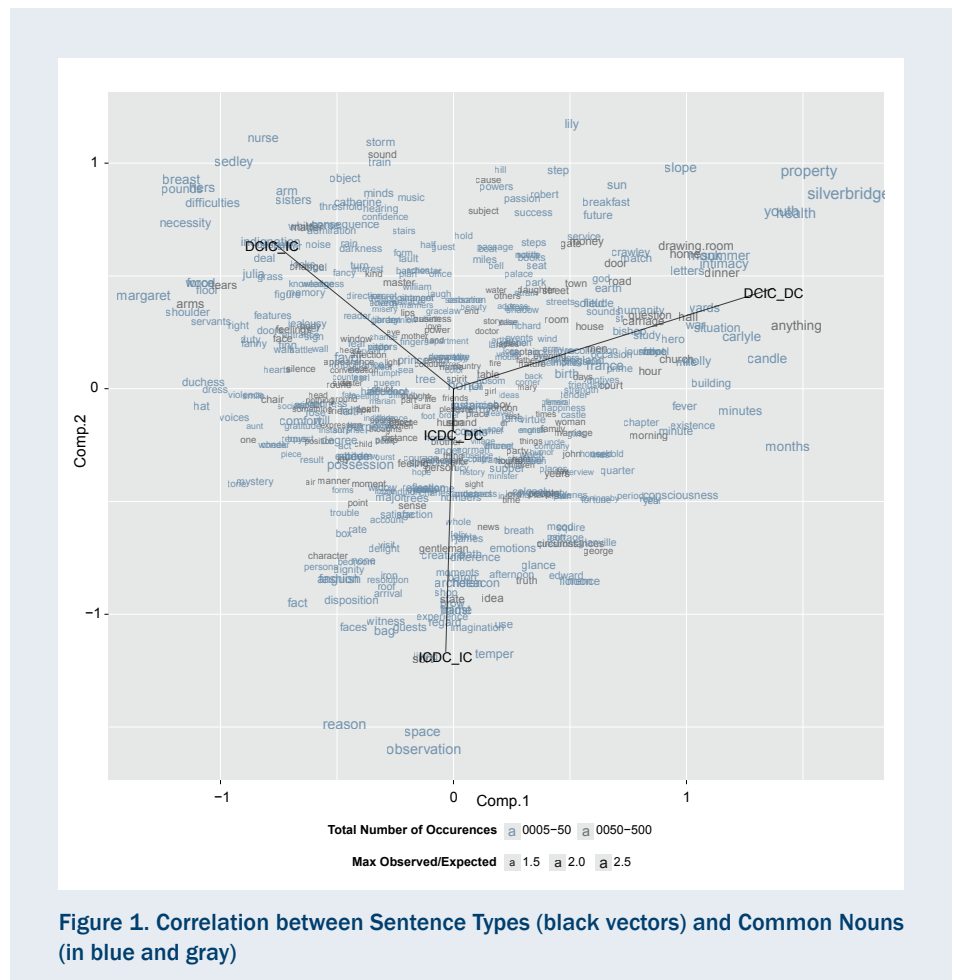


Figure 1. Correlation between Sentence Types (black vectors) and Common Nouns (in blue and gray)

taneously much bigger and much smaller than the usual: three thousand novels and a handful of words for loudness; or, as in Figure 3: The Correlation between Verb Forms (black vectors) and Nineteenth-Century Novelistic Genres.

The eleven different literary genres are represented by the colored word strips, and the twenty-odd verb forms are indicated by the black vectors. No one experiences literature as a scatter plot of verb forms and genres. Reading a novel; watching a play; listening to a ballad: this is the lived experience of literature. And instead, here

### What is at stake is not reading, it's the continuity between the experience of reading a book and the production of knowledge.

literature is decomposed into its extremes; but this radical reduction also allows us to see a *relationship* between the very small and the very large that would otherwise remain hidden: how crucial the passive past simple is for the rhetoric of Gothic novels, for instance, or progressive tenses for the *Bildungsroman*. And it's not just a matter

of "seeing" the relationship; you can *work* on it: change the variables, use adjectives instead of verbs to test if they differentiate genres better; exclude function words or include them; you can conduct small experiments with historical evidence. This says something important about the new object of study: it is not something we have found somewhere (in an archive, say); it's something we have constructed for a specific purpose; it's not a given, it's the result of a new *practice*. A new type of work that, before the advent of digital corpora and tools, was simply unimaginable.

Which brings me to a question I have often been asked, and rightly so: Will the humanities of the digital age lose what has so powerfully characterized them – the experience of reading a book from beginning to end? And, I don't want to answer for the humanities in general, but for those of us in digital literary studies the answer has to be, Yes: reading a book from beginning to end loses its centrality, because it no longer constitutes the foundation of knowledge. Our objects are much bigger than a book, or much smaller than a book, and in fact usually both things at once; but *they're almost never a book*. The pact with the digital has a price, which is this drastic loss of "measure." Books are so human-sized; now that right size is gone. We're not happy about the loss; but it seems to be a necessary consequence of the new approach.

Now, let me be clear about this: this does not mean that literary critics, let alone readers in general, shouldn't read books any more. Reading is one of the greatest pleasures of life; it would be insane to give it up. What is at stake is not reading, it's *the conti-*

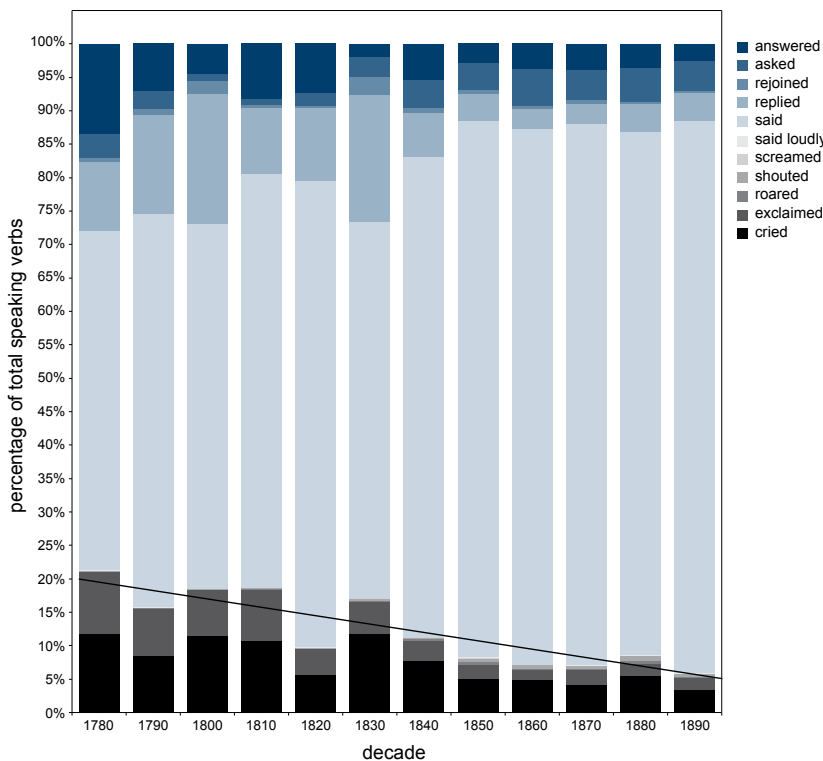


Figure 2. Types of Speaking Verbs by Decade

nunity between the experience of reading a book and the production of knowledge. That’s the point. I read a lot of books, but when I work in the Literary Lab they’re not the basis of my work. The “lived experience” of literature no longer morphs into knowledge, as in Ricoeur’s great formula of the “hermeneutic of listening,” where understanding consists in hearing what the text has to say. In our work we don’t listen, we ask questions; and we ask them of large corpora, not of individual texts. It’s a completely different epistemology.

Do we not read at all, then? Well, not exactly. You may have noticed a crazy out-

lier at the top of Figure 3: each of the strips indicates a set of two hundred narrative sentences from various novels, and that one, from the early chapters of *Middlemarch*, was so extreme, we of course took those two hundred sentences and read them very, very carefully. The question is, were we thereby reading *Middlemarch*? I don’t think so. The sentences came from *Middlemarch*, yes, but they couldn’t be “read” like one reads a novel because they were not continuous with each other; rather, they formed a series only on the basis of a grammatical peculiarity we wanted to investigate. No one could

have ever “seen” them together while reading *Middlemarch*. We were studying *Middlemarch*, then, but not by reading it.

The objects have changed, and the scale has changed, and the type of work, and of knowledge, and the relationship to reading. And this of course raises all sorts of other questions: are the old and the new type of knowledge – in conflict? Complementary? Independent of each other? And the study of these new objects – what exactly has it achieved? *Has* it achieved anything? But, for today, this is enough.

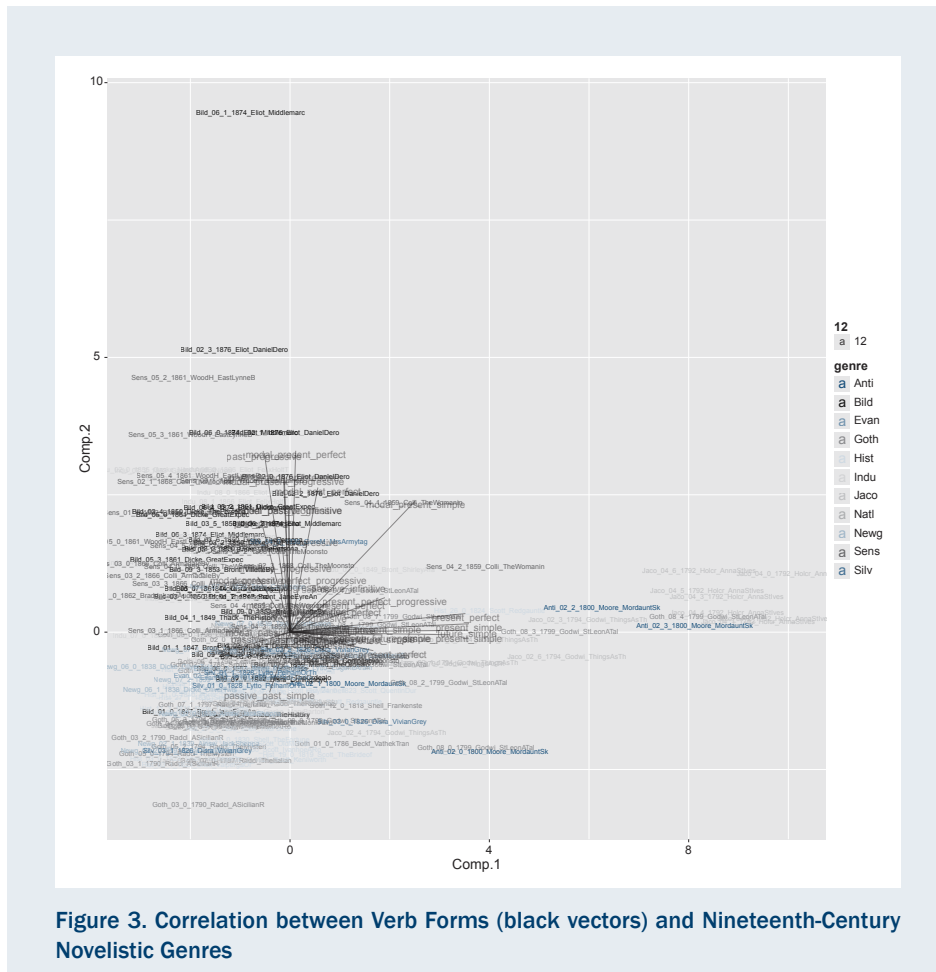


Figure 3. Correlation between Verb Forms (black vectors) and Nineteenth-Century Novelistic Genres





## Joshua Cohen

*Joshua Cohen is the Marta Sutton Weeks Professor of Ethics in Society and Professor of Political Science, Philosophy, and Law at Stanford University. He was elected a Fellow of the American Academy in 2002.*

**M**y presentation is entitled “If I Had a Hammer.”

I am a philosopher by training and sensibility. A political philosopher. That means I bring a philosopher’s sensibility and training to social and political issues. I have written about equality, liberty, democracy, and global justice.

I think that qualifies me as a kind of humanist. But with apologies to Elaine Treharne, I am not a digital humanist. I am not saying that as a confession; it is not an invitation for congratulation; and it is certainly not a criticism of others who are. I am just giving a self-description. When I am working as a philosopher, I use digital tools as devices of communication and presentation; I don’t use them as tools for analysis. Their availability has not changed the way that I approach questions.

**When I am working as a philosopher, I use digital tools as devices of communication and presentation; I don’t use them as tools for analysis. Their availability has not changed the way that I approach questions. . . . nor do I think they should.**

Moving now from self-description to a normative statement: nor do I think they should. I want to use this occasion to reflect on why. As I see the issue, it is all about the questions you ask. Inquiry, including philosophical inquiry, aims to answer questions, and philosophical questions, generally speaking, are not nails awaiting the power of a digital hammer. To put the point less metaphorically, they are not best answered using digital analytical tools.

But – a little more windup before I get to the pitch – who cares that I am not a digital humanist?

Let me try to provoke a bit of interest. Though I am not a digital humanist, I teach a course at Stanford’s design school (the d.school) called Designing Liberation Technologies, in which students try to develop innovative uses of mobile technology to address human development issues in Nairobi’s informal settlements. I am also principal investigator for a few of the projects that have grown out of the course. In addition, I recently coauthored, with eighteen others, an article in *Science* that is partly about uses of digital tools to ensure research transparency in the social sciences. And I work half time at Apple. So I don’t embrace a generic digital Luddism. My reluctance to use digital tools when I am working as a political philosopher comes from a sense of the specifics of the intellectual terrain – the questions at issue – not from a general predisposition.

To explain what I mean, I will tell a couple of stories.

In 1983, I was thinking about writing a book on Rousseau. The book – *Rousseau: A Free Community of Equals* – did eventually appear in 2010. (My mind was on other things for some time in between.) But the year is relevant, because I began thinking about the book before I had a computer. As some of you may have observed, Apple’s Macintosh computer was released thirty years ago, certainly long before I could have even imagined doing interesting things with digitized texts. I finished the book in 2010, when those tools were available.

When you start to write a book on Rousseau, one of the things you have to do is figure out his idea of the general will. I was at MIT when I started the book, and I asked my research assistant to go through *The Social Contract* and a couple of other Rousseauian texts to find all uses of the phrase “general will” and its cognates. I cannot recall how long it took her, but I am pretty confident that it took more time than it would have taken when I was finishing up the book several years later. But in the final year of working on the book (2009), I didn’t see any need to check or redo her analysis. I could have quickly redone it to check the results. I could have checked a larger range of texts, including texts by others. And as Franco Moretti’s comments indicated, I could have done some more interesting things than sheer enumeration. I did think about it. But I decided not to do it. Why? Well, for one, I was anxious to be done. But more to the point, it didn’t seem important to me. I had a hammer, but

I wasn't inclined to see Rousseau as a nail. Why not?

When I was writing this book on Rousseau, I had two connected purposes – one smaller, one larger. The smaller purpose was to provide an interpretation of Rousseau's political philosophy that came closer than existing interpretations to meeting the standards of analytical philosophy: the theses needed to be more crisply stated than in other interpretations, maybe even more crisply than Rousseau himself. I wanted the book to make the arguments more explicit, assess the arguments, reformulate theses and arguments, and get them to a point where they might be able to with-

stand critical scrutiny. (I am well aware that Rousseau's writing is filled with apparent paradoxes defying crisp statement and argument, and aware, too, that some people celebrate those paradoxes as the true measure of his genius. I demur.)

debate, the central question is: what should we think about justice, autonomy, obligation, equality, and related ideas? What views on these issues are most reasonable or true? Text analysis of the kind that I had my assistant do was helpful, but in a very secondary, supportive role. It wasn't the heart of the matter, because in writing the book, I thought of Rousseau as a partner in the discussion, not an object of theoretical scrutiny. The largest purpose in examining and reconstructing Rousseau's view was not to explain why he thought what he thought, but to figure out what to think. The assumption behind my writing on Rousseau was that he was a remarkable thinker who offered a distinctive

## **Inquiry, including philosophical inquiry, aims to answer questions, and philosophical questions, generally speaking, are not best answered using digital analytical tools.**

stand critical scrutiny. (I am well aware that Rousseau's writing is filled with apparent paradoxes defying crisp statement and argument, and aware, too, that some people celebrate those paradoxes as the true measure of his genius. I demur.)

The second, larger purpose served by the first was to present a distinctive political-philosophical outlook, arguably occupied by Rousseau: a position that presents social cooperation as a way to live autonomously, and political participation as the key to sustaining that cooperation, rather than thinking of society as a bargain that requires a sacrifice of autonomy for the safety assured by a commanding authority. Really? *Live with other people in a community in which we give the law to ourselves?* What a wild idea. Wild and profoundly important. By presenting that outlook, I thought of the book as contributing to a debate in political philosophy. In that

way of thinking about social and political life. So in deciding what to think, it was important to come to terms with other views: not only Rousseau's, of course, but his, too.

I am emphasizing that the question I wanted to answer was not why Rousseau held the views that he held or how those views were shaped by a mix of personal experience, political context, and regnant ideas. Those are great questions on which much of interest has been written. But I think of those as questions more for historians or social scientists. Writing the book as a philosopher, I wanted to know what to think about the normative questions that Rousseau addressed, not to explain why he thought what he thought (except insofar as figuring that out helped to address the more fundamental question). Had I been addressing the historical question of why he thought, for example, that a social com-

pact is the right way to think about political legitimacy, then I would have wanted tools for handling large data, and not just textual data. But in thinking about the very same normative questions that Rousseau was addressing – in imagining myself in a kind of conversation with him about justice, freedom, and equality – those tools are, at most, of indirect use.

Now you may be thinking that this is all a matter of idiosyncratic personal choice, or something specific to political philosophy. I do not think so. And to explain why, I will switch to a second example.

For the past few years, I have been working with three wonderful philosophers – Alex Byrne from MIT, Gideon Rosen from Princeton, and Seana Shiffrin from UCLA – on the first ever *Norton Introduction to Philosophy*. The book, out later this year, will cover a broad range of issues: God's existence, self-knowledge, the mind/body problem, the nature of color, the existence (or not) of numbers, the metaphysics of morals, how to reason about what's right, and whether equality is essential to justice, among many other things. Our work has been made vastly easier by Dropbox and costless search (and I don't mind that somebody is monetizing all my information). Still, nothing in the substance of the book is significantly different from what it would have been in 1983: that is, nothing has changed as a consequence of the existence of tools for analysis of vast amounts of data. We had a hammer, but did not find nails. In putting the book together, we did not see how thinking about or answering the questions of the book would have been aided by the tools of the digital revolution.

One area where you might think I am off-base is the philosophy of mind. Consider what the philosopher David Chalmers has called “the hard problem of consciousness,” which he describes this way:

It is undeniable that some organisms are subjects of experience. But the question

of how it is that these systems are subjects of experience is perplexing. Why is it that when our cognitive systems engage in visual and auditory information-processing, we have visual or auditory experience: the quality of deep blue, the sensation of middle C? How can we explain why there is something it is like to entertain a mental image, or to experience an emotion? It is widely agreed that experience arises from a physical basis, but we have no good explanation of why and how it so arises. Why should physical processing give rise to a rich inner life at all? It seems objectively unreasonable that it should, and yet it does.<sup>1</sup>



### Michael A. Keller

*Michael A. Keller is the Ida M. Green University Librarian, Director of Academic Information Resources, Publisher of Stanford University Press, and Founder and Publisher of HighWire Press at Stanford University. He was elected a Fellow of the American Academy in 2010.*

For about fifty years now, philosophers of mind have been thinking about computational models of mind: whether those models are correct, and how, if at all, they throw light on this hard problem of consciousness – about the relationship between physical processing and an inner life. But that line of thinking, as important and rich as it is, strikes me as completely different from anything in the enterprise of the digital humanities, which is about using digital tools to bring large amounts of data to bear on answering humanistic questions. The philosophical questions that Rousseau was addressing, or the question that Chalmers describes as the hard problem of consciousness – about what to think about fundamental normative and conceptual questions – are addressed by clear thinking, close attention to argument (what follows from what), reflection on the distinctions between cases and among concepts, and an exploration of imaginative hypotheticals and possibilities.

Given the questions, I don't see how having more data helps.

These remarks will address the taxonomy of types of research output in the digital humanities, about why people undertake research in the digital humanities, and some of the associated issues. I will conclude with a proposition, but let me begin with an announcement. Just today, Stanford's Libraries, in collaboration with the Bibliothèque nationale de France, released the *French Revolution Digital Archive* (<http://frda.stanford.edu>), a searchable, readable collection of 101 volumes of the *Archives parlementaires* and a collection of many thousands of images from contemporaneous sources. It took seven years for our large transatlantic team to put together the archive, four or five of those years being taken up with determining who owned the copyright on the most recent volumes.

The French Revolution Digital Archive is an example of an anthology, in the taxonomy of types of research in the digital humanities. Another classic example is the *Valley of the Shadow* (<http://valley.lib.virginia.edu>), organized by Ed Ayres and others at the University of Virginia. These are in essence modern digital versions of anthologies that we all have used, but they are much more extensive, they allow more searching, and they allow deeper understanding of texts. Often they involve images as well, as in the case of the French Revolution Digital Archive. They allow scholars to do their own work from a great distance, to collaborate with one another at great distances, and to comment in a very quick, modern way.

The second type is what I would call an interactive scholarly work, with three subtypes. Almost all of these interactive works involve novel visualization techniques, and a great many of them use geospatial information systems to present the results of their work. The first subtype is what I might call a simulation model. One example is *ORBIS: The Stanford Geospatial Network Model of the Roman World* (<http://orbis.stanford.edu>). It allows one to ask questions about trade routes and communication in the Roman Empire at different times of the year and among the more than seven hundred cities that made up the Roman Empire at its height. It is a focused look at the Roman Empire, but it allows you to interrogate the data, which have been aggregated from many different sources, in order to form a new hypothesis or create a new research direction. As a model for other projects, ORBIS is marvelous because it doesn't have to be just about trade routes in the Roman Empire. The ORBIS approach could be employed on other social and human behaviors, using various approaches to aggregating information, then displaying findings in order to allow humans to interrogate it.

<sup>1</sup> David J. Chalmers, "Facing Up to the Problem of Consciousness," *Journal of Consciousness Studies* 2 (3) (1995).

The second subtype is what one might call a reference tool. *Kindred Britain* (<http://kindred.stanford.edu>) is an example of a reference tool. It shows family relationships among the great and good in Britain. It is a project that started by coding biographical information from about eight sources, and it has many more to add. *Kindred Britain* allows one to see such connections as how Charles Darwin is related to Henry VIII. It has fascinating possibilities for understanding relationships in any society.

## Digital humanities allow more people to interact with the humanities. . . . These projects allow much larger audiences to participate in our work, and that is very important.

The third subtype is the Spatial History Lab work (<http://spatialhistory.stanford.edu>). The example that I like best is *The Broken Paths of Freedom* project, which focuses on the trading of people as slaves in Brazil. It aggregates data and information across time, and then plots it onto maps. It looks at texts, revealing new knowledge and new understandings at various points in time. The kind of work that Franco Moretti described earlier, researching texts as data by using quantitative methods, would also fall within this subtype. A Stanford graduate student is carrying out another project that seeks to understand the evolution of Portuguese language in mainland Europe as well as Portuguese in Brazil. Around fifty thousand texts have been analyzed so far, some from Brazil and some from Portugal. It is a fascinating linguistic study that in prior years would have been impossible to do. It is also a truly interdisciplinary project, bringing language and literary scholars together with an evolutionary biologist who hopes to understand what is going on in these two

lines of development – one in Portugal, one in Brazil – from an evolutionary-biological or mathematical-biological perspective.

Another type that Elaine Treharne mentioned, which she called *augmented books*, I would call *the new narrative*. It is a ribbon of text, or an oral narration, interspersed with media objects. It enriches the repertory of communication. One good example is something called *Composing Southern* (<http://www.jacquelinehettel.com/composing-southern/>), which is about the

language and culture of the Southern United States. Another is *A Game of Shark and Minnow* (<http://www.nytimes.com/newsgraphics/2013/10/27/south-china-sea/>), a project about the seaside culture off the Philippines published by *The New York Times* with high production values.

So why the digital humanities? Well, these methods of research, of presentation and aggregation, allow new questions to be asked. The old questions are still there, and they can still be asked, but there are new, often interdisciplinary questions, with interdisciplinary answers made possible. Knowledge can be derived that otherwise would not be derived at all. Franco Moretti has called this “the macroscopic study of cultural history.” Another reason that people engage in the digital humanities is because it allows them to engage a lot more data and metadata than ever before. The data could be of a single form, such as text, or it could be of multiple forms, such as text, images, statistics, or maps. This often involves digitization, and encoding is

usually necessary. It is the relentless, stupid consistency of computers that makes these kinds of exercises possible, but it is the creative minds of scholars who put the relentlessly stupid computers to work. A fantastic project on Romanesque and Gothic structures in France is under way by Stephen Murray at Columbia University (<http://learn.columbia.edu/bourb/>). He measures, analyzes, and then visualizes Romanesque and Gothic structures, enabling him to draw conclusions about the types of models that the master builders carried in their heads in order to build everything from parish churches to cathedrals. Using lasers to take dozens of measurements, he can recreate, with great exactitude, the proportions of these structures, and then compare them.

Elaine Treharne also mentioned the possibilities for consultation so that communities of scholars, distant from one another, can work on the same cultural phenomenon or the same collection of objects. More important, in a way, are the new opportunities for scholars to engage students and others, perhaps through crowdsourcing, in research projects. It is a way of bringing novices into the discipline and creating enthusiasm in others by way of one’s own enthusiasm for the possibilities. These types of projects must tackle questions of evidence, attribution, media awareness, logical thinking, organization, and complex arrays of data. Presentation skills in multimedia, digital, and network environments are necessary in these projects. They are great labs, a place for people to get their hands dirty, and a place to learn. Almost all of these projects enable the reuse and remixing of data, whether it is text or images or anything else. We are going to have an expanding collection of information that can be used for many different projects.

Digital humanities, and especially their output, allow more people to interact with the humanities. What a great thing is that!

Our problem in the humanities is in part a problem of our own making. How do we explain to the general intellectual public why it is we do what we do, and why what we do is so interesting? How wonderful many of our projects are, and yet how difficult to convey that enthusiasm to the common man, the so-called man on the street. These projects allow much larger audiences to participate in our work, and that is very important.

There are a thousand flowers blooming all over in the digital humanities right now. There are applications being written or adapted, data being assembled or coded in numerous ways. There are projects that have proceeded over reasonably long periods of time, many with editorial and curation efforts connected to them. The real problem is understanding the spread and the scope of all this work. We don't have a good way of understanding who is doing what, and how we might intersect with one another. It is important that we do so. On the other hand, it is really important that the scholars who are engaged in this work not have to connect all the dots and all the locations where this work is going on. It is much more important for a thousand flowers to be blooming than to have a single agency harvesting the flowers.

One serious problem is that there is almost no peer review on these projects. Peer review on the importance of the contribution to the commonwealth of knowledge rarely happens with these projects. That is a great shame, because these projects then cannot easily be used in questions of appointment, promotion, and tenure, especially for junior colleagues. Will these interactive projects, which are possibly capstone projects for people receiving an M.A. or Ph.D., be accepted? Not right now (at least not that I know of). We need to separate our judgment of the nature of the contribution from the "gee whiz" aspects of what is being done. They are integrally linked, and yet the nature of the question posed and the answer

## How does a library host and preserve the fundamentals of these research products, so that they may be useful to others in another place and another time?

is quite important. We have in this field a kind of echo chamber. Some of us go to the same conferences. We need to find ways to expand our understanding of what is going on out there so that we might adopt and adapt methods that others have developed.

There is the question of sustainability. Many of the best projects are undertaken by excellent principal investigators with a team of students and staff, but how do these projects look once the PI has stepped away and moved on to another study? How do we sustain these projects so that audiences can come back not just for a decade, but for a century, or five centuries? How do we make it possible for this knowledge to live on, as knowledge has lived on in book form, on paper, for many centuries? How does a library get engaged with this to host and preserve the fundamentals of these research products, so that they may be useful to others in another place and another time? Enabling and supporting the reuse and remixing of the data are essential.

The suitability of the technical architecture to support sharing of data, the quality and extent of metadata, is important. How do we understand the data and the coding of the data? Are APIs (application programming interfaces) available to make the data accessible and to interact across projects? On the projects themselves, is there help to make the novice easily acquainted with the possibilities? Are there explicit models of interaction? Are there user-friendly interfaces? Are there models or samples that a teacher in a K-12 situation might employ to take advantage of the work that has been done by these digital projects and these digital humanists?

I mentioned copyright when I talked about the French Revolution Digital Archive. These are serious issues, and I didn't mean to make light of them, but there is also the question of authorship. Who is the author? Who is the principal investigator? Is the principal investigator or the principal developer the author? And what about the scads of students? In the sciences, we see articles with anywhere from ten to a hundred coauthors. What does it mean to be an author in these cases? How do we recognize the vital contributions made by multiple contributors?

Are there licensing issues with the applications and with the data? Should we know about that if we want to try to reuse the data? If they are open source applications, how can we be sure that they will be viable and usable, not ten years hence, which is already a problem, but fifty years? Our technology is not ripe enough to allow that kind of long, sustained access to these projects. So with special regard to one of the big issues, I propose that we think about engaging publishers and libraries in these projects. The issue of peer review, of technical review, and of marketing and distribution are serious issues, and many of them are issues that publishers deal with all the time. ■

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To view or listen to the presentations, visit <https://www.amacad.org/humanitiesdigitalage>.

## Select Prizes and Awards

**Danielle Allen** (Institute for Advanced Study) is the recipient of a 2013 PROSE Award from the Association of American Publishers.

**C. David Allis** (Rockefeller University) has been awarded the 2014 Japan Prize in Life Sciences.

**Frederick M. Ausubel** (Harvard Medical School; Massachusetts General Hospital) has been awarded the Thomas Hunt Morgan Medal from the Genetics Society of America.

**John Banville** (Dublin, Ireland) was elected to the American Academy of Arts and Letters.

**Wendell Berry** (Port Royal, Kentucky) was elected to the American Academy of Arts and Letters.

**Jeffrey A. Bluestone** (University of California, San Francisco) was elected a member of the Institute of Medicine.

**Dale L. Boger** (Scripps Research Institute) received the AACR Award for Outstanding Achievement in Chemistry in Cancer Research from the American Association for Cancer Research.

**Lewis M. Branscomb** (Harvard University) received the American Association for the Advancement of Science's 2014 Philip Hauge Abelson Prize.

**Ronald Breslow** (Columbia University) has been awarded the 2014 American Institute of Chemists Gold Medal.

**Dorothy L. Cheney** (University of Pennsylvania) received an honorary degree from the University of Neuchâtel, Switzerland.

**John A. Clements** (University of California, San Francisco) is the recipient of the Mary Ellen Avery Neonatal Research Award, given by the American Pediatrics Society and the Society for Pediatric Research.

**Michael Cook** (Princeton University) received the Holberg Prize from the Norwegian Parliament.

**Stanley Crouch** (*New York Daily News*) is the recipient of a 2013 PROSE Award from the Association of American Publishers.

**Titia de Lange** (Rockefeller University) is the recipient of a 2014 Canada Gairdner International Award.

**Jennifer Doudna** (University of California, Berkeley) was awarded the Lurie Prize in the Biomedical Sciences.

**Gideon Dreyfuss** (Perelman School of Medicine, University of Pennsylvania) was elected a member of the Institute of Medicine.

**Richard A. Epstein** (University of Chicago) received the Norman Maclean Faculty Award from the University of Chicago.

**Joseph Fins** (Weill Cornell Medical College) was elected an Academico de Honor of the Real Academia Nacional de Medicina de España (Royal National Academy of Medicine of Spain).

**Marye Anne Fox** (University of California, San Diego) is the recipient of the 2014 Clark Kerr Award for Distinguished Leadership in Higher Education.

**Saul Friedländer** (University of California, Los Angeles) is the recipient of a 2014 Dan David Prize.

**Elaine Fuchs** (Rockefeller University) received the 2014 Pezcoller Foundation-AACR International Award for Cancer Research from the American Association for Cancer Research.

**Naomi Halas** (Rice University) was elected a member of the National Academy of Engineering.

**Ann Hamilton** (Ohio State University) was elected to the American Academy of Arts and Letters.

**Siegfried Hecker** (Stanford University) received the American Association for the Advancement of Science's 2014 Award for Science Diplomacy.

**Martin Hellwig** (Max-Planck-Institut zur Erforschung von Gemeinschaftsgütern) is the recipient of a 2013 PROSE Award from the Association of American Publishers.

**Sarah Blaffer Hrdy** (Winters, California) is the recipient of the National Academy of Sciences' 2014 Award for Scientific Reviewing.

**Toyo Ito** (Toyo Ito & Associates, Architects) was elected to the American Academy of Arts and Letters.

**Ha Jin** (Boston University) was elected to the American Academy of Arts and Letters.

**Ira Katznelson** (Social Science Research Council; Columbia University) was awarded a 2014 Bancroft Prize for *Fear Itself: The New Deal and the Origins of Our Time*.

**Robert Kirshner** (Harvard-Smithsonian Center for Astrophysics) has received the James Craig Watson Medal of the National Academy of Sciences.

**Richard D. Kolodner** (University of California, San Diego) was elected a member of the Institute of Medicine.

**Phyllis Lambert** (The Canadian Centre for Architecture) is the recipient of a 2013 PROSE Award from the Association of American Publishers.

**Simon Levin** (Princeton University) was awarded the 2014 Tyler Prize for Environmental Achievement.

**Eve Marder** (Brandeis University) received an Alumni Achievement Award from Brandeis University. She was also elected a member of the Institute of Medicine.

**Daniel Mendelsohn** (New York, New York) is the recipient of the 2014 Harold D. Vursell Memorial Award from the American Academy of Arts and Letters.

**Brenda Milner** (McGill University) is the recipient of a 2014 Dan David Prize.

**Franco Moretti** (Stanford University) won a National Book Critics Circle Award for Criticism for *Distant Reading*.

**Eric Nestler** (Mount Sinai School of Medicine) is the recipient of a 2013 PROSE Award from the Association of American Publishers.

**William Nordhaus** (Yale University) is the recipient of a 2013 PROSE Award from the Association of American Publishers.

**Jessye Norman** (New York, New York) received the 2014 Bob Marley Award from the American Foundation for the University of the West Indies.

**Moshe Oren** (Weizmann Institute of Science) was elected a foreign associate of the Institute of Medicine.

**Helen Piwnica-Worms** (University of Texas MD Anderson Cancer Center) was elected a member of the Institute of Medicine.

**H. Vincent Poor** (Princeton University) was inducted into the State of Alabama Engineering Hall of Fame.

**Danny Reinberg** (New York University School of Medicine) was elected a member of the Institute of Medicine.

**Jennifer Rexford** (Princeton University) was elected to the National Academy of Engineering.

**Jeremy Sabloff** (Santa Fe Institute) is the recipient of the Society for American Archaeology's 2014 Lifetime Achievement Award.

**Esa-Pekka Salonen** (Philharmonia Orchestra) was awarded the Michael Ludwig Nemmers Prize in Music Composition.

**Peter Salovey** (Yale University) was elected a member of the Institute of Medicine.

**Robert D. Schreiber** (Washington University in St. Louis School of Medicine) received the AACR-CRI Lloyd J. Old Award in Cancer Immunology from the American Association for Cancer Research and the Cancer Research Institute.

**Robert Seyfarth** (University of Pennsylvania) received an honorary degree from the University of Neuchâtel, Switzerland.

**Yakov Sinai** (Princeton University) was awarded the 2014 Abel Prize by the Norwegian Academy of Science and Letters.

**Donald Steiner** (University of Chicago) received an Alumni Medal from the University of Chicago.

**Gerald Stern** (Drew University) is the 2014 recipient of the Frost Medal of the Poetry Society of America.

**Steven Strogatz** (Cornell University) received the American Association for the Advancement of Science's 2014 Award for Public Engagement with Science.

**Subra Suresh** (Carnegie Mellon University) was elected a member of the Institute of Medicine.

**Richard Tapia** (Rice University) received the 2014 Vannevar Bush Award from the National Science Board.

**Roger Unger** (University of Texas Southwestern Medical Center) received the 2014 Rolf Luft Award from the Karolinska Institutet.

**Alice Waters** (Chez Panisse Foundation/Chez Panisse) was elected to the American Academy of Arts and Letters.

**Brenda Wineapple** (New York, New York) received an Arts and Letters Award in Literature from the American Academy of Arts and Letters.

**Tobias Wolff** (Stanford University) was elected to the American Academy of Arts and Letters.

**Eli Yablonoitch** (University of California, Berkeley) was awarded the 2014 Rank Prize.

## New Appointments

**Gordon M. Binder** (Coastview Capital, LLC) will lead One Global Mediation's Biotech/Pharmaceutical and Patent sectors.

**Kenneth I. Chenault** (American Express Company) has been elected a member of the Harvard Corporation.

**Mary Sue Coleman** (University of Michigan) has been elected to the Board of Directors of The Kavli Foundation.

**James J. Collins** (Boston University) was appointed to the Scientific Advisory Board of Agilis Biotherapeutics, LLC.

**Karen S. Cook** (Stanford University) has been elected to the Council of the National Academy of Sciences.

**Peter B. Dervan** (California Institute of Technology) has been appointed a Trustee of the Yale Corporation.

**Michael V. Drake** (University of California, Irvine) has been named President of The Ohio State University.

**Victor J. Dzau** (Duke University) has been named President of the Institute of Medicine.

**John G. Hildebrand** (University of Arizona) has been elected Foreign Secretary of the National Academy of Sciences.

**Madeleine M. Kunin** (University of Vermont) was named Chair of the Board of Directors of Emerge Vermont.

**Richard C. Levin** (Yale University) was named Chief Executive Officer of Coursera.

**Joseph Loscalzo** (Harvard Medical School; Brigham & Women's Hospital) has been elected to the Board of Directors of Isis Pharmaceuticals, Inc.

**Richard A. Meserve** (Carnegie Institution for Science) has been elected to the Board of Directors of The Kavli Foundation.

**Nancy A. Moran** (University of Texas, Austin) has been elected to the Council of the National Academy of Sciences.

**Margaret M. Murnane** (University of Colorado) has been elected to the Council of the National Academy of Sciences.

**Stanley B. Prusiner** (University of California, San Francisco) has been appointed to the Board of Overseers of Weill Cornell Medical College.

**Richard Revesz** (New York University School of Law) has been named Director of the American Law Institute.

**Geraldine Richmond** (University of Oregon) has been named President-Elect of the American Association for the Advancement of Science.

**Sharon Percy Rockefeller** (WETA) has been named Chairman of the Board of Trustees of the National Gallery of Art.

**Randy Schekman** (University of California, Berkeley) has been elected to the Council of the National Academy of Sciences.

**James Shapiro** (Columbia University) was elected as Co-Vice President of the Authors Guild.

**David J. Skorton** (Cornell University) has been named Secretary of the Smithsonian Institution.

**Lawrence Summers** (Harvard University) has been named Board Chair of the Center for Global Development.

**Terence Tao** (University of California, Los Angeles) has been named Patron of the International Mathematical Olympiad Foundation.

**Anne Tatlock** (Fiduciary Trust Company International) has been named to the Board of Trustees of Carnegie Corporation of New York.

**Phyllis M. Wise** (University of Illinois at Urbana-Champaign) has been elected to the Board of Trustees of the Robert Wood Johnson Foundation.

## Select Publications

### Poetry

**J. D. McClatchy** (Yale University). *Plundered Hearts: New and Selected Poems*. Knopf, April 2014

### Fiction

**Peter Ackroyd** (*London Times*). *Three Brothers: A Novel*. Doubleday/Nan Talese, April 2014

**Aharon Appelfeld** (Ben-Gurion University of the Negev, Israel). *Suddenly, Love*. Schocken, May 2014

**Russell Banks** (Princeton University). *A Permanent Member of the Family*. Ecco, November 2013

**Roz Chast** (*The New Yorker*). *Can't We Talk About Something More Pleasant? A Memoir*. Bloomsbury, May 2014

**Jim Lehrer** (The NewsHour with Jim Lehrer). *Top Down: A Novel of the Kennedy Assassination*. Random House, October 2013

**Frank Lentricchia** (Duke University). *The Dog Killer of Utica*. Melville International Crime, April 2014

**John Lithgow** (Los Angeles, California). *Never Play Music Right Next to the Zoo*. Simon & Schuster, October 2013

**Francine Prose** (New York, New York). *Lovers at the Chameleon Club, Paris 1932*. Harper, May 2014

**Lore Segal** (New York, New York). *Half the Kingdom*. Melville House, October 2013

### Nonfiction

**Simon Blackburn** (University of Cambridge). *Mirror, Mirror: The Uses and Abuses of Self-Love*. Princeton University Press, March 2014

**Martin J. Blaser** (New York University School of Medicine). *Missing Microbes: How the Overuse of Antibiotics Is Fueling Our Modern Plagues*. Henry Holt & Co., April 2014

**Archie Brown** (University of Oxford). *The Myth of the Strong Leader: Political Leadership in the Modern Age*. Basic Books, April 2014

**Antoine Compagnon** (Columbia University). *Un Été Avec Montaigne*. Éditions des Équateurs, May 2013

**Wendy Doniger** (University of Chicago Divinity School). *On Hinduism*. Oxford University Press, March 2014

**Greg J. Duncan** (University of California, Irvine) and **Richard J. Murnane** (Harvard Graduate School of Education). *Restoring Opportunity: The Crisis of Inequality and the Challenge for American Education*. Russell Sage and Harvard Education Press, January 2014

**Louis Dupré** (Yale University). *The Quest of the Absolute: Birth and Decline of European Romanticism*. University of Notre Dame Press, September 2013

**Paul R. Ehrlich** (Stanford University) and Michael Charles Tobias (Dancing Star Foundation). *Hope on Earth: A Conversation*. University of Chicago Press, April 2014

**Kelly Sims Gallagher** (Senior Scholar in Residence, 2011–2012; Tufts University). *The Globalization of Clean Energy Technology: Lessons from China*. MIT Press, April 2014

**Rebecca Goldstein** (Harvard University). *Plato at the Googleplex: Why Philosophy Won't Go Away*. Pantheon, March 2014

**Michael Hechter** (Arizona State University). *Alien Rule*. Cambridge University Press, October 2013

**Bernd Heinrich** (University of Vermont). *The Homing Instinct: Meaning & Mystery in Animal Migration*. Houghton Mifflin Harcourt, April 2014

**Anjelica Huston** (Gray Angel Productions). *A Story Lately Told: Coming of Age in Ireland, London, and New York*. Scribner, November 2013

**Richard J. Murnane** (Harvard Graduate School of Education) and **Greg J. Duncan** (University of California, Irvine). *Restoring Opportunity: The Crisis of Inequality and the Challenge for American Education*. Russell Sage and Harvard Education Press, January 2014

**Diana C. Mutz** (University of Pennsylvania) and Seth K. Goldman (University of Massachusetts, Amherst). *The Obama Effect: How the 2008 Campaign Changed White Racial Attitudes*. Russell Sage, April 2014

**Martha C. Nussbaum** (University of Chicago Law School). *Political Emotions: Why Love Matters for Justice*. Harvard University Press, October 2013

**Simon Schama** (Columbia University). *The Story of the Jews: Finding the Words 1000 BCE–1492 CE*. Ecco, March 2014

**Alfred Stepan** (Columbia University) and **Charles Taylor** (McGill University), eds. *Boundaries of Toleration*. Columbia University Press, February 2014

**Charles Taylor** (McGill University) and **Alfred Stepan** (Columbia University), eds. *Boundaries of Toleration*. Columbia University Press, February 2014

**J. Craig Venter** (J. Craig Venter Institute). *Life at the Speed of Light: From the Double Helix to the Dawn of Digital Life*. Viking, November 2013

**Edward O. Wilson** (Harvard University). *A Window on Eternity: A Biologist's Walk Through Gorongosa National Park*. Simon & Schuster, May 2014

*We invite all Fellows and Foreign Honorary Members to send notices about their recent and forthcoming publications, scientific findings, exhibitions and performances, and honors and prizes to [bulletin@amacad.org](mailto:bulletin@amacad.org). ■*



# Remembrance

*It is with sadness that the Academy notes the passing of the following members.\**

Robert Arnold Alberty – January 18, 2014; elected in 1968

Robert Richardson Bowie – November 2, 2013; elected in 1956

Howard Brenner – February 17, 2014; elected in 1999

Edgar M. Bronfman, Sr. – December 21, 2013; elected in 2001

James Francis Cahill – February 14, 2014; elected in 1976

Bryan C. Clarke – February 27, 2014; elected in 2004

John Warcup Cornforth – December 8, 2013; elected in 1973

Stephen Harry Crandall – October 29, 2013; elected in 1961

Donald Morris Crothers – March 16, 2014; elected in 1986

Robert Alan Dahl – February 5, 2014; elected in 1960

Lance Edwin Davis – January 20, 2014; elected in 1991

Martin Dworkin – February 6, 2014; elected in 1997

Theodore Eisenberg – February 23, 2014; elected in 2010

George Eisenman – December 11, 2013; elected in 1982

William Tallant Greenough – December 18, 2013;  
elected in 2006

Thomas Parke Hughes – February 3, 2014; elected in 1982

Alison Bishop Jolly – February 6, 2014; elected in 1992

Michael Gedaliah Kammen – November 29, 2013;  
elected in 1979

Justin Kaplan – March 2, 2014; elected in 1981

Fred Kavli – November 21, 2013; elected in 2006

Joseph Wilfred Kerman – March 17, 2014; elected in 1973

David Morris Kipnis – February 5, 2014; elected in 1974

Sydney Govons Kustu – March 18, 2014; elected in 1992

Juan Jose Linz – October 1, 2013; elected in 1976

James Lockhart – January 17, 2014; elected in 1997

Boris Magasanik – December 25, 2013; elected in 1960

Nelson Mandela – December 5, 2013; elected in 2009

Patrick J. McGovern – March 19, 2014; elected in 2002

Dale T. Mortensen – January 9, 2014; elected in 2000

Walter Yasuo Oi – December 24, 2013; elected in 1993

Janet Davison Rowley – December 17, 2013; elected in 1991

Abdelhamid Ibrahim Sabra – December 18, 2013;  
elected in 1975

Frederick Sanger – November 19, 2013; elected in 1958

Alan McLeod Sargeson – December 29, 2008; elected in 1998

Joseph Lawrence Sax – March 9, 2014; elected in 1992

George Latimer Shinn – December 16, 2013; elected in 1989

John Hyslop Steele – November 4, 2013; elected in 1980

Kenneth Noble Stevens – August 19, 2013; elected in 1989

Walther Stoeckenius – August 12, 2013; elected in 1985

Michael George Parke Stoker – August 13, 2013; elected in 1973

Stanley Jeyarajah Tambiah – January 19, 2014; elected in 1981

Charles M. Vest – December 12, 2013; elected in 1991

Harry Hershhal Wasserman – December 29, 2013;  
elected in 1969

Gerald Beresford Whitham – January 26, 2014; elected in 1959

William J. Willis – November 1, 2012; elected in 1993

Arthur Michael Wolfe – February 17, 2014; elected in 1995

Alejandro Cesar Zaffaroni – March 2, 2014; elected in 1973

*\*Notice received from November 6, 2013, to March 26, 2014*

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*Bulletin* Spring 2014  
Issued as Volume LXVII, No. 3  
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*The Bulletin of the American Academy of Arts & Sciences* (ISSN 0002-712X) is published quarterly by the American Academy of Arts & Sciences, 136 Irving Street, Cambridge, MA 02138. Periodicals rate postage paid at Boston, MA, and at additional mailing offices. Postmaster: Send address changes to *Bulletin*, American Academy of Arts & Sciences, 136 Irving Street, Cambridge, MA 02138.

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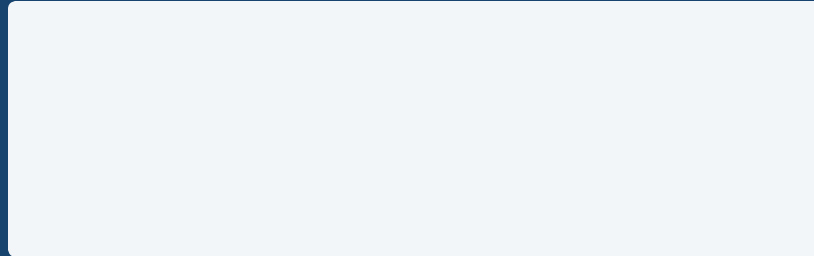
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